FIG. 1

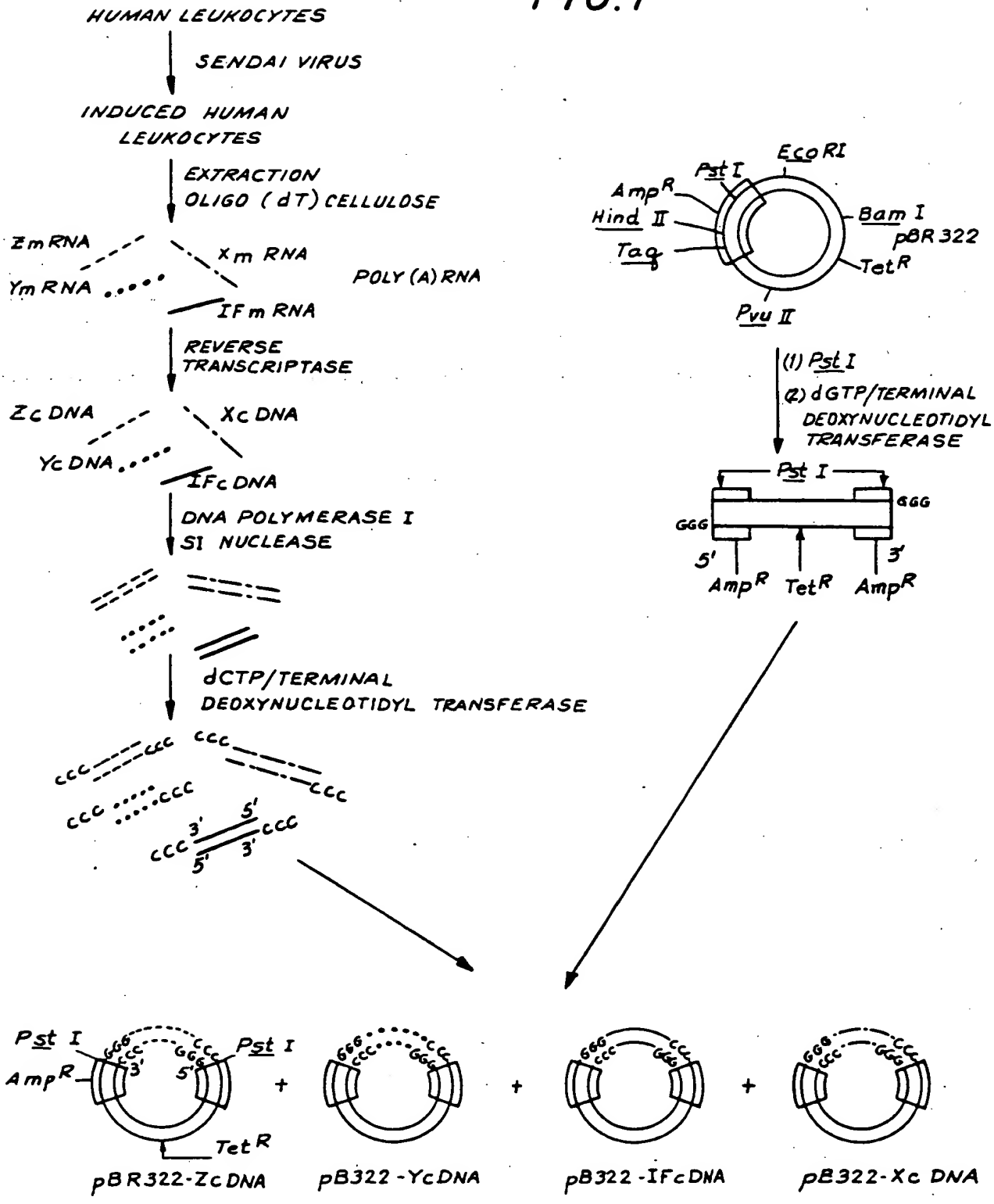

HUMAN LEUKOCYTES
SENDAI VIRUS
INDUCED HUMAN LEUKOCYTES
EXTRACTION
OLIGO (dT) CELLULOSE
Zm RNA
Xm RNA
Ym RNA
POLY (A) RNA
IFm RNA
REVERSE TRANSCRIPTASE
Zc DNA
Xc DNA
Yc DNA
IFc DNA
DNA POLYMERASE I
SI NUCLEASE
dCTP/TERMINAL DEOXYNUCLEOTIDYL TRANSFERASE
Eco RI
Pst I
Amp R
Hind II
Tag
Bam I
pBR 322
Tet R
Pvu II
(1) Pst I
(2) dGTP/TERMINAL DEOXYNUCLEOTIDYL TRANSFERASE
Pst I
GGG
CCC
5'
3'
Amp R
Tet R
Amp R
pBR322-Zc DNA
pB322-Yc DNA
pB322-IFc DNA
pB322-Xc DNA

FIG. 2

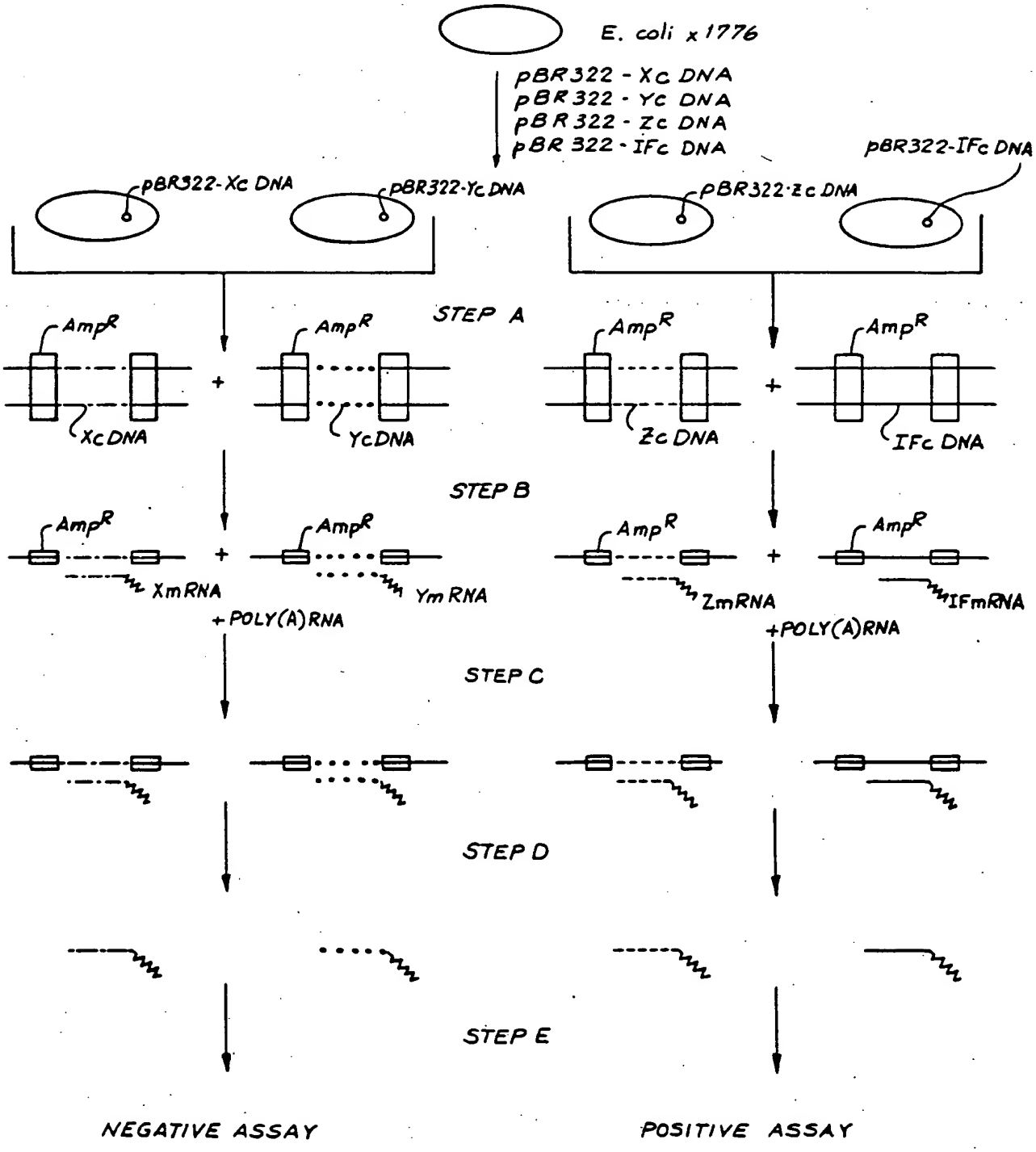

E. coli x1776
pBR322 - Xc DNA
pBR322 - Yc DNA
pBR322 - Zc DNA
pBR322 - IFc DNA
pBR322-Xc DNA
pBR322-Yc DNA
pBR322-Zc DNA
pBR322-IFc DNA
STEP A
Amp^R
Xc DNA
Yc DNA
Zc DNA
IFc DNA
STEP B
Xm RNA
Ym RNA
Zm RNA
IFm RNA
+POLY(A)RNA
STEP C
STEP D
STEP E
NEGATIVE ASSAY
POSITIVE ASSAY

FIG. 3

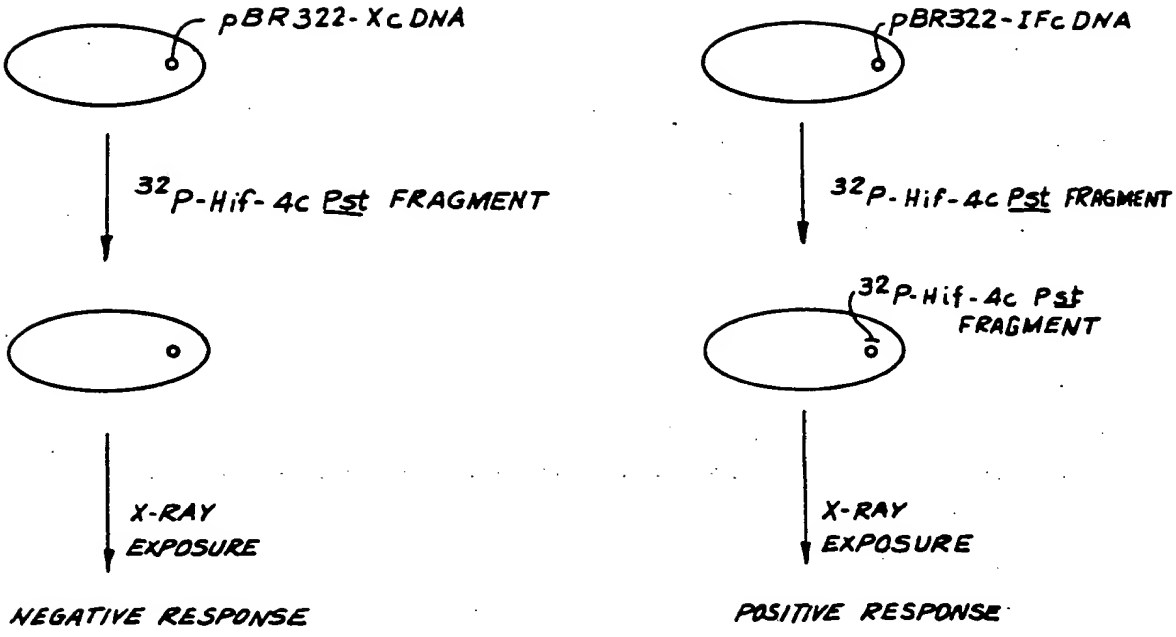

pBR322-Xc DNA
32P-Hif-4c Pst FRAGMENT
X-RAY EXPOSURE
NEGATIVE RESPONSE
pBR322-IFc DNA
32P-Hif-4c Pst FRAGMENT
32P-Hif-4c Pst FRAGMENT
X-RAY EXPOSURE
POSITIVE RESPONSE

FIG. 4

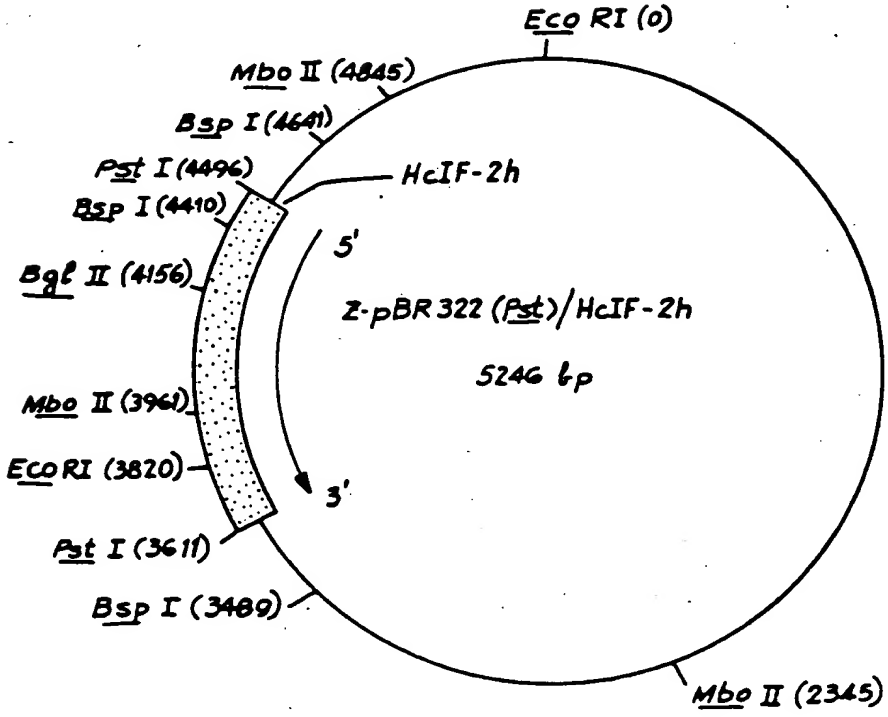
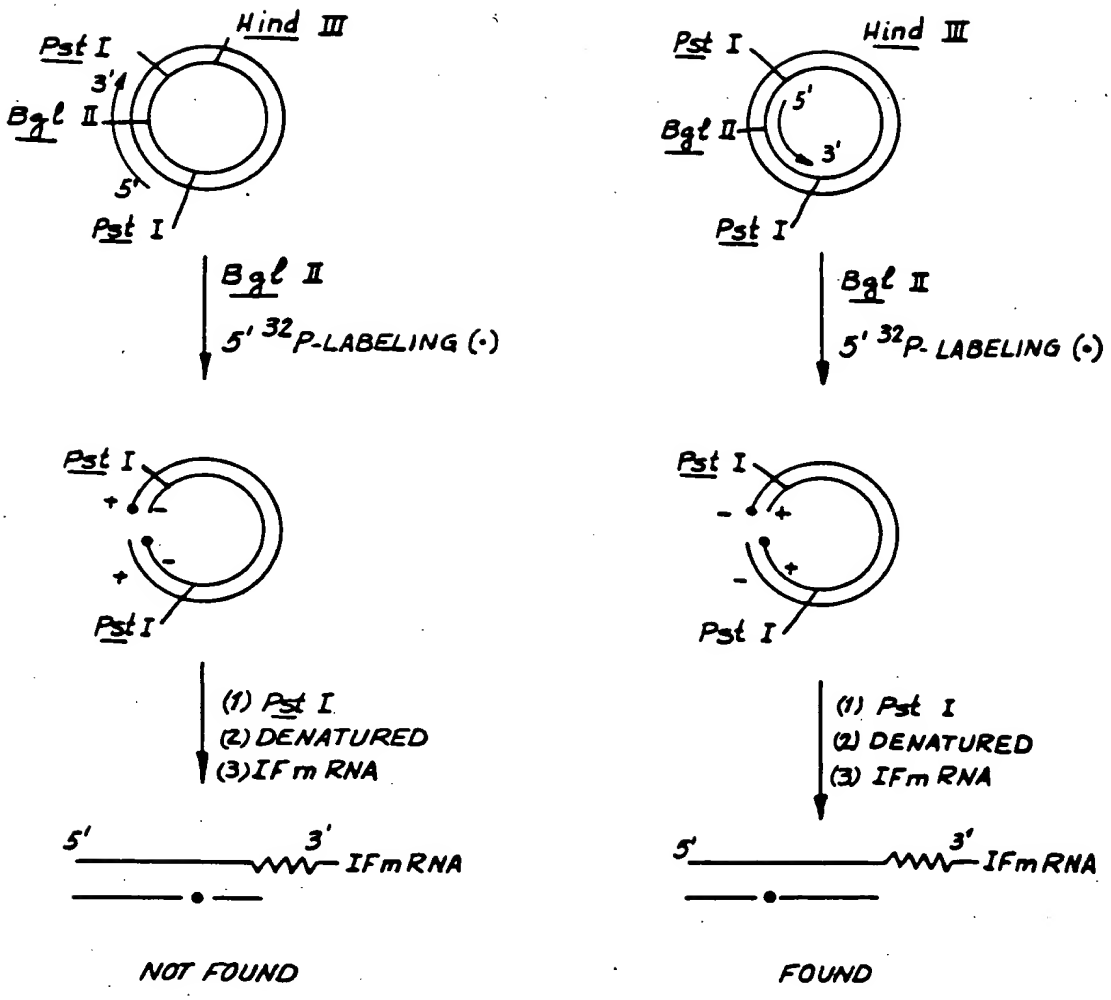

Eco RI (0)
Mbo II (4845)
Bsp I (4641)
Pst I (4496)
Bsp I (4410)
Bgl II (4156)
Mbo II (3961)
EcoRI (3820)
Pst I (3611)
Bsp I (3489)
Mbo II (2345)
HcIF-2h
5'
3'
Z-pBR322 (Pst)/HcIF-2h
5246 bp

FIG. 5


Hind III
Pst I
3'
Bgl II
5'
Pst I
Bgl II
5' 32P-LABELING (•)
Pst I
+
+
-
Pst I
(1) Pst I
(2) DENATURED
(3) IFm RNA
5'
3'
IFmRNA
NOT FOUND
Pst I
Hind III
Pst I
5'
Bgl II
3'
Pst I
Bgl II
5' 32P- LABELING (•)
Pst I
-
+
+
-
Pst I
(1) Pst I
(2) DENATURED
(3) IFm RNA
5'
3'
IFmRNA
FOUND

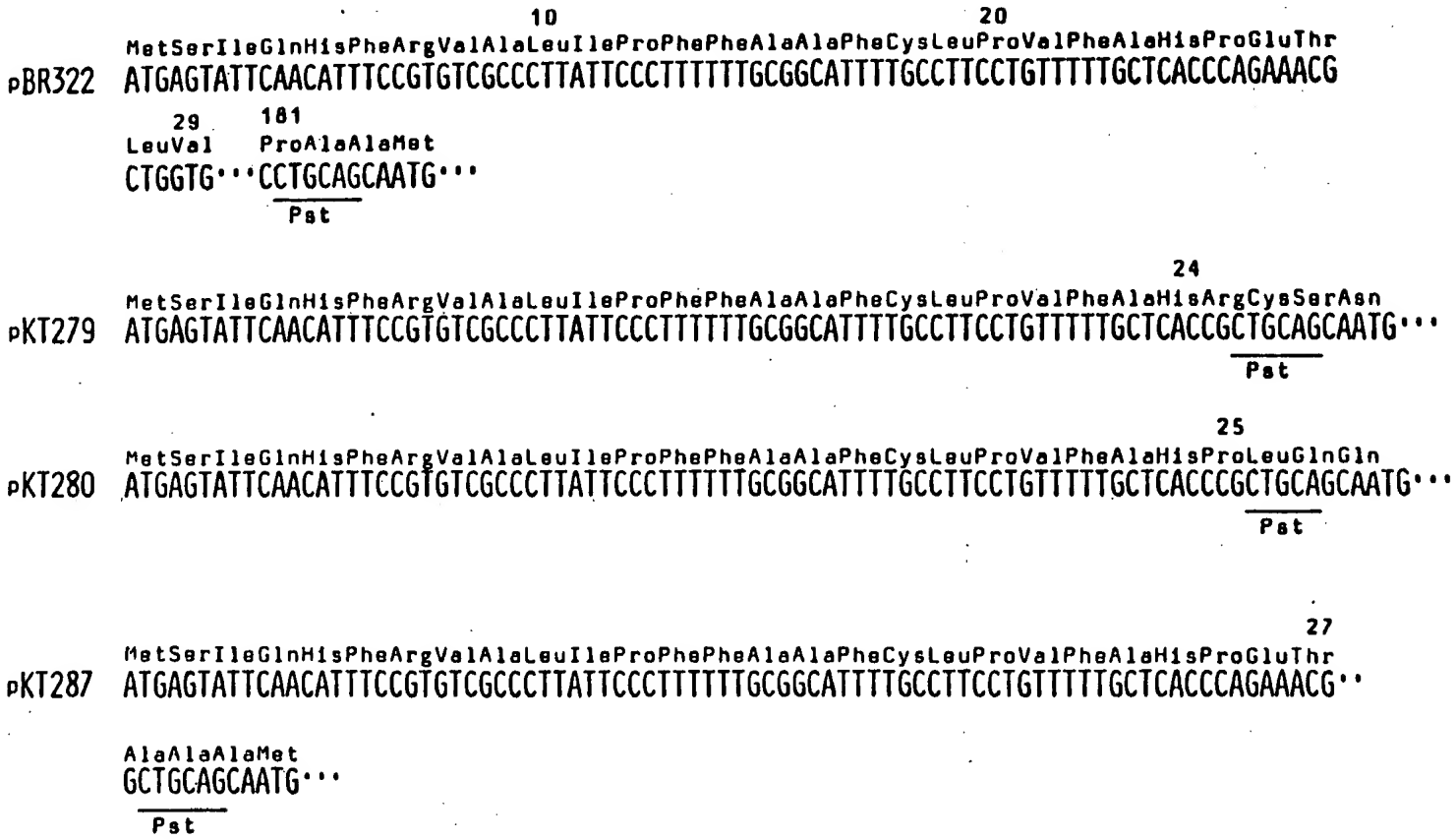
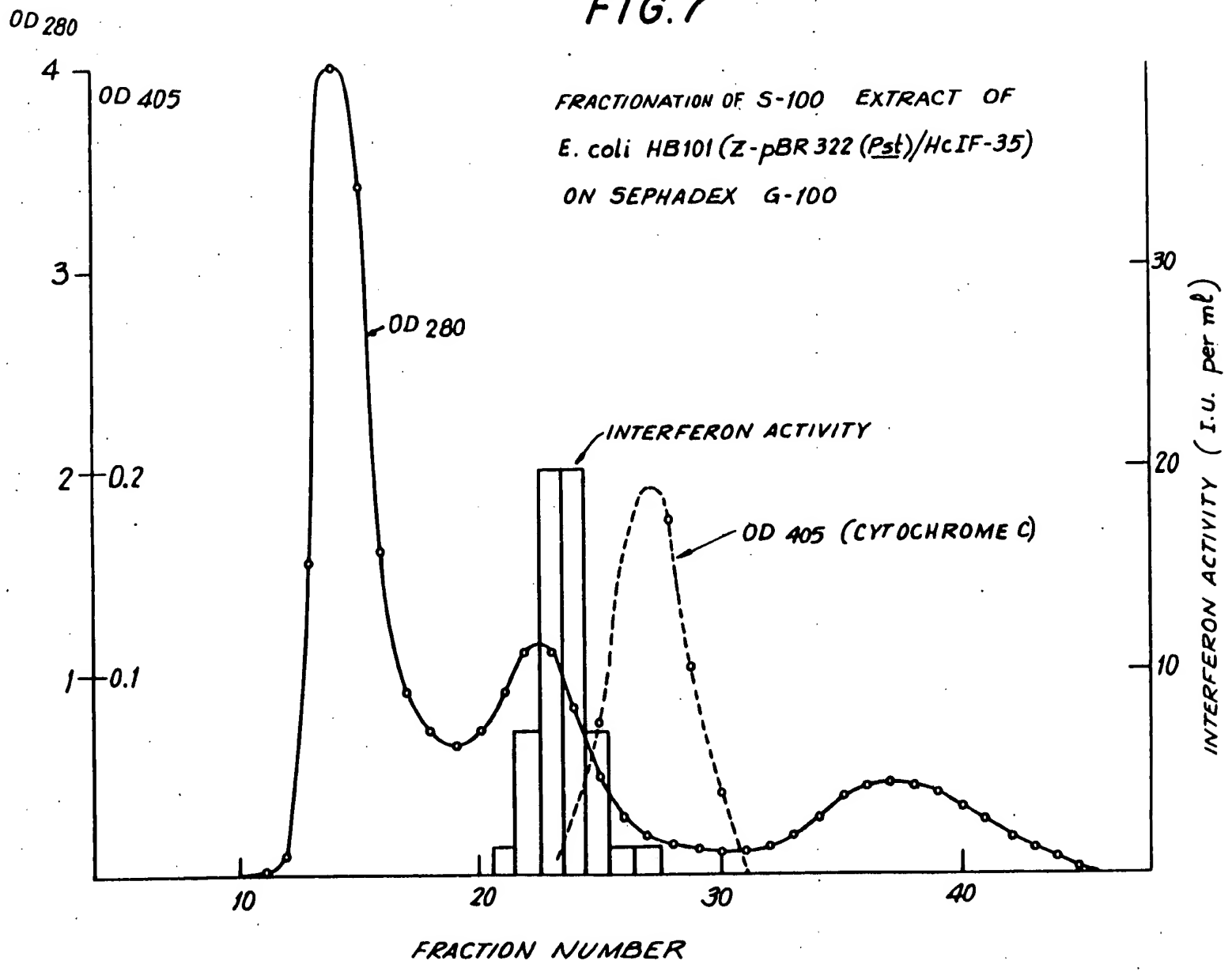


FIG 6

FIG. 7



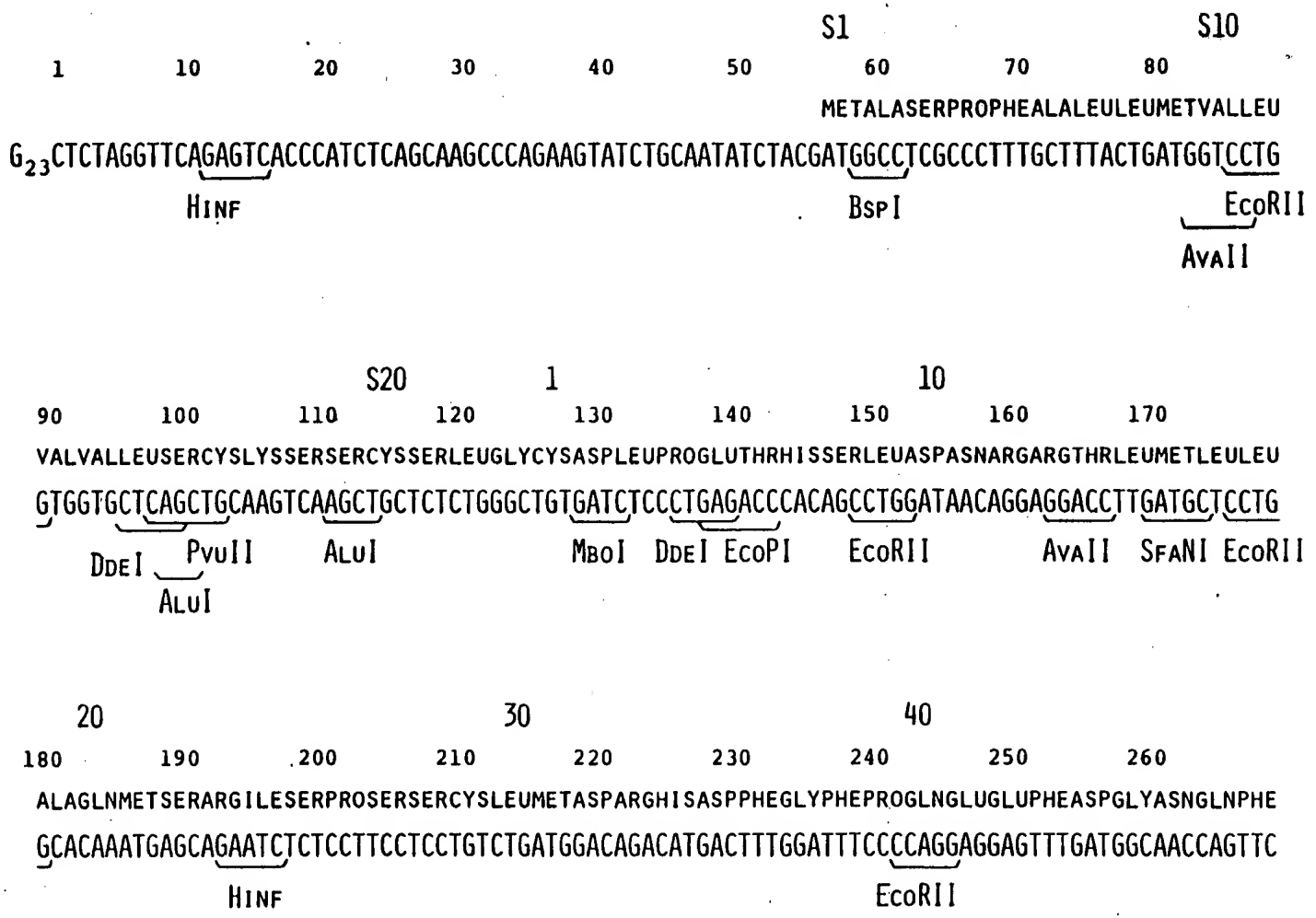


FIG. 8

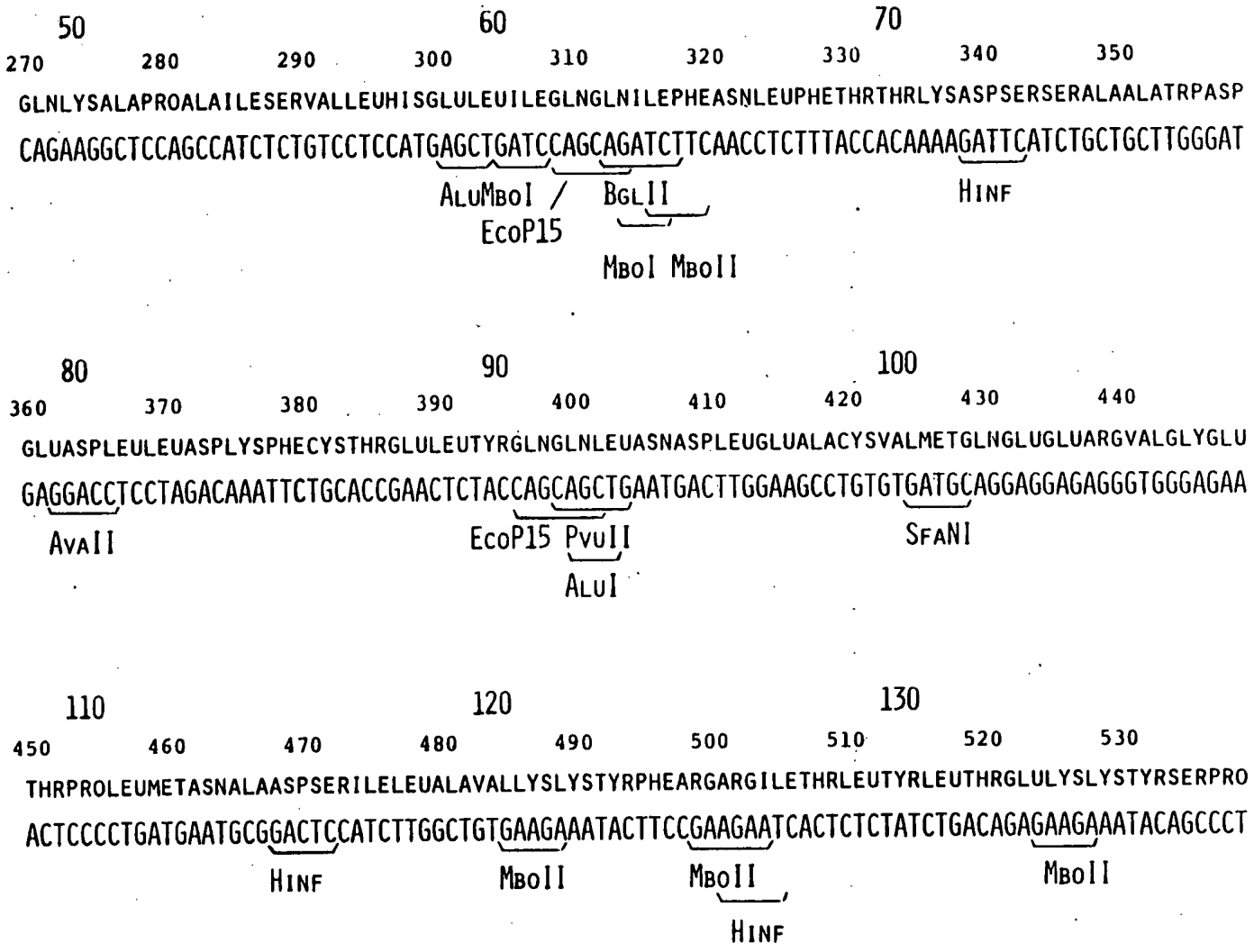

50
60
70
270
280
290
300
310
320
330
340
350
GLNLYSALAPROALAILESERVALLEUHISGLULEUILEGLNGLNILEPHEASNLEUPHETHRTHRLYSASPSERSERALAALATRPASP
CAGAAGGCTCCAGCCATCTCTGTCCTCCATGAGCTGATCCAGCAGATCTTCAACCTCTTTACCACAAAAGATTCATCTGCTGCTTGGGAT
AluMboI / BglII
EcoP15
HinfI
MboI MboII
80
90
100
360
370
380
390
400
410
420
430
440
GLUASPLEULEUASPLYSPHECYSTHRGLULEUTYRGLNGLNLEUASNASPLEUGLUALACYSVALMETGLNGLUGLUARGVALGLYGLU
GAGGACCTCCTAGACAAATTCTGCACCGAACTCTACCAGCAGCTGAATGACTTGGAAGCCTGTGTGATGCAGGAGGAGAGGGTGGGAGAA
AvaII
EcoP15 PvuII
SfaNI
AluI
110
120
130
450
460
470
480
490
500
510
520
530
THRPROLEUMETASNALAASPSERILELEUALAVALLYSLYSTYRPHEARGARGILETHRLEUTYRLEUTHRGLULYSLYSTYRSERPRO
ACTCCCCTGATGAATGCGGACTCCATCTTGGCTGTGAAGAAATACTTCCGAAGAATCACTCTCTATCTGACAGAGAAGAAATACAGCCCT
HinfI
MboII
MboII
MboII
HinfI

FIG.9

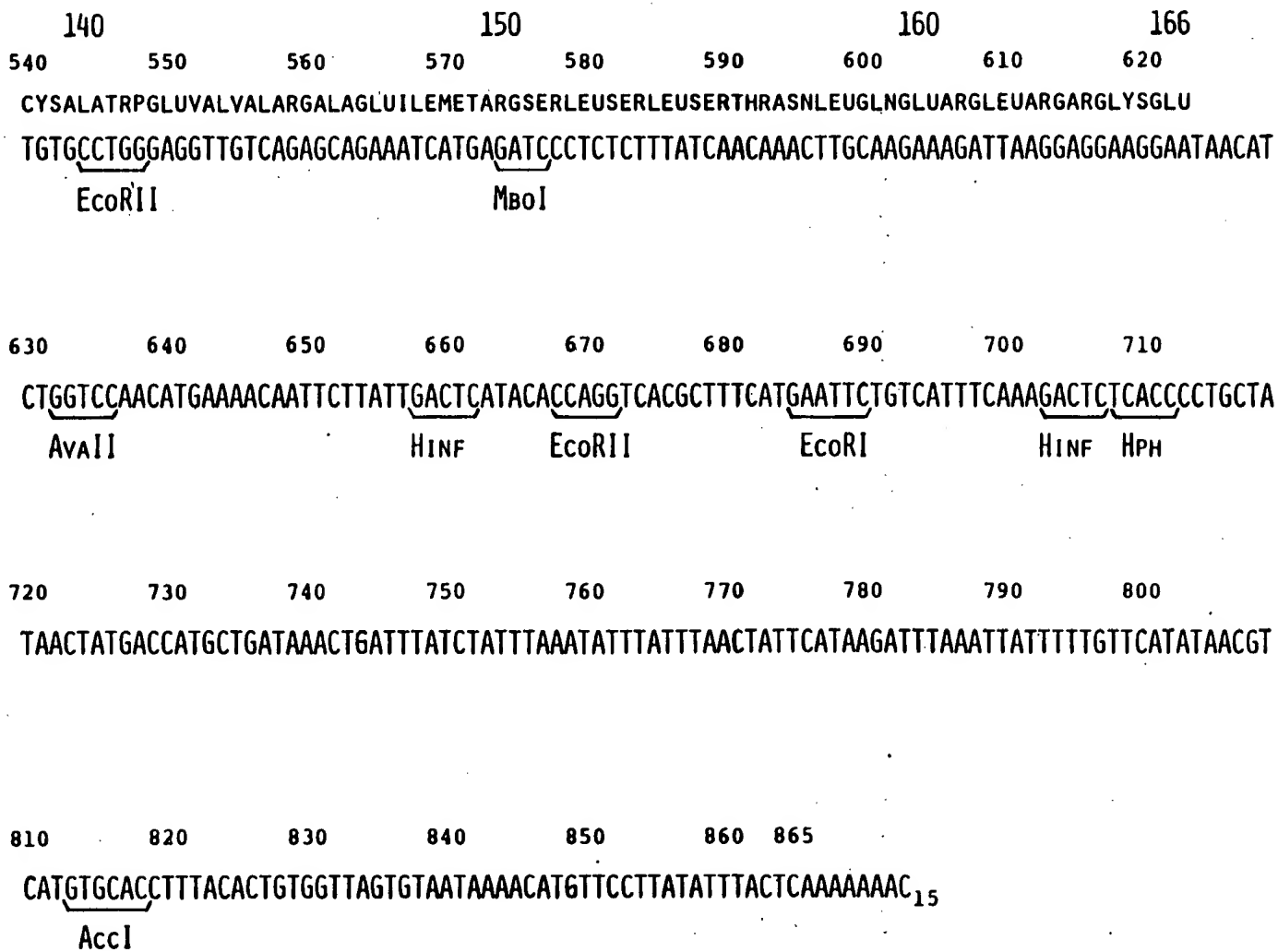
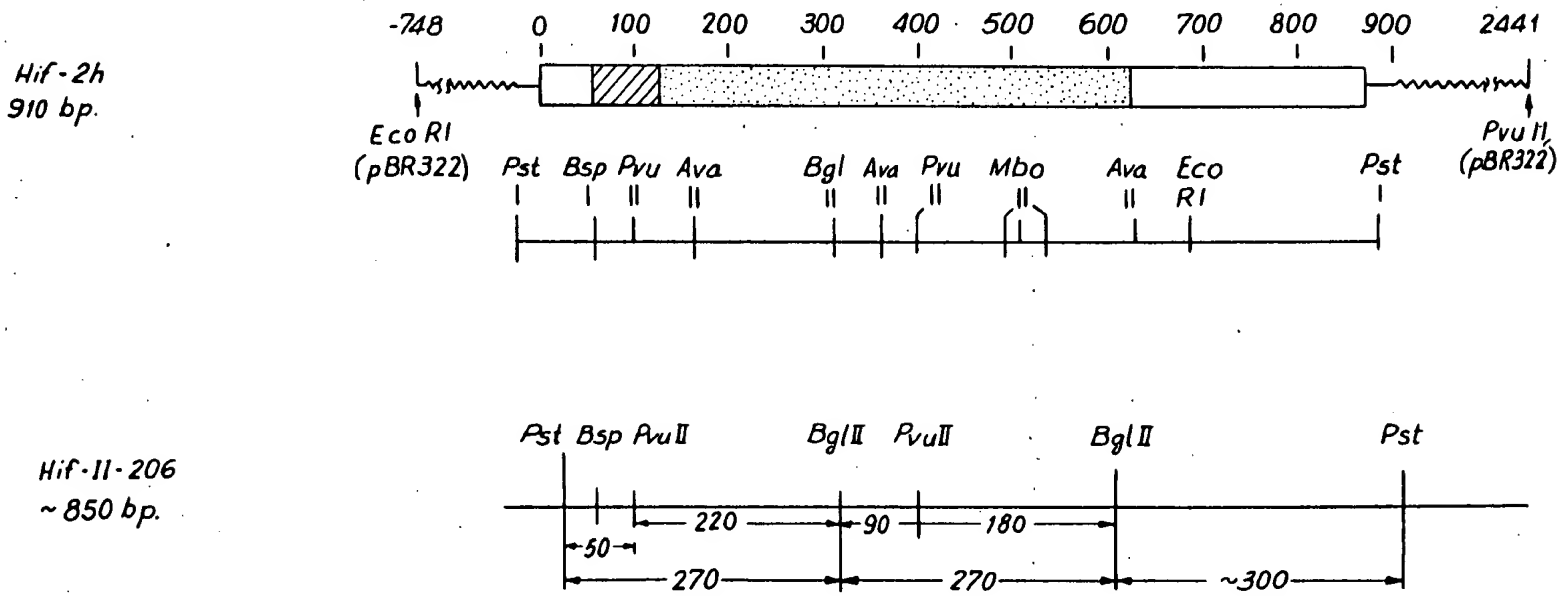


FIG. 10

FIG. II


Hif-2h
910 bp.
-748
0
100
200
300
400
500
600
700
800
900
2441
Eco RI
(pBR322)
Pvu II
(pBR322)
Pst
Bsp
Pvu
Ava
Bgl
Ava
Pvu
Mbo
Ava
Eco
RI
Pst
Hif-II-206
~850 bp.
Pst
Bsp
PvuII
BglII
PvuII
BglII
Pst
220
90
180
50
270
270
~300

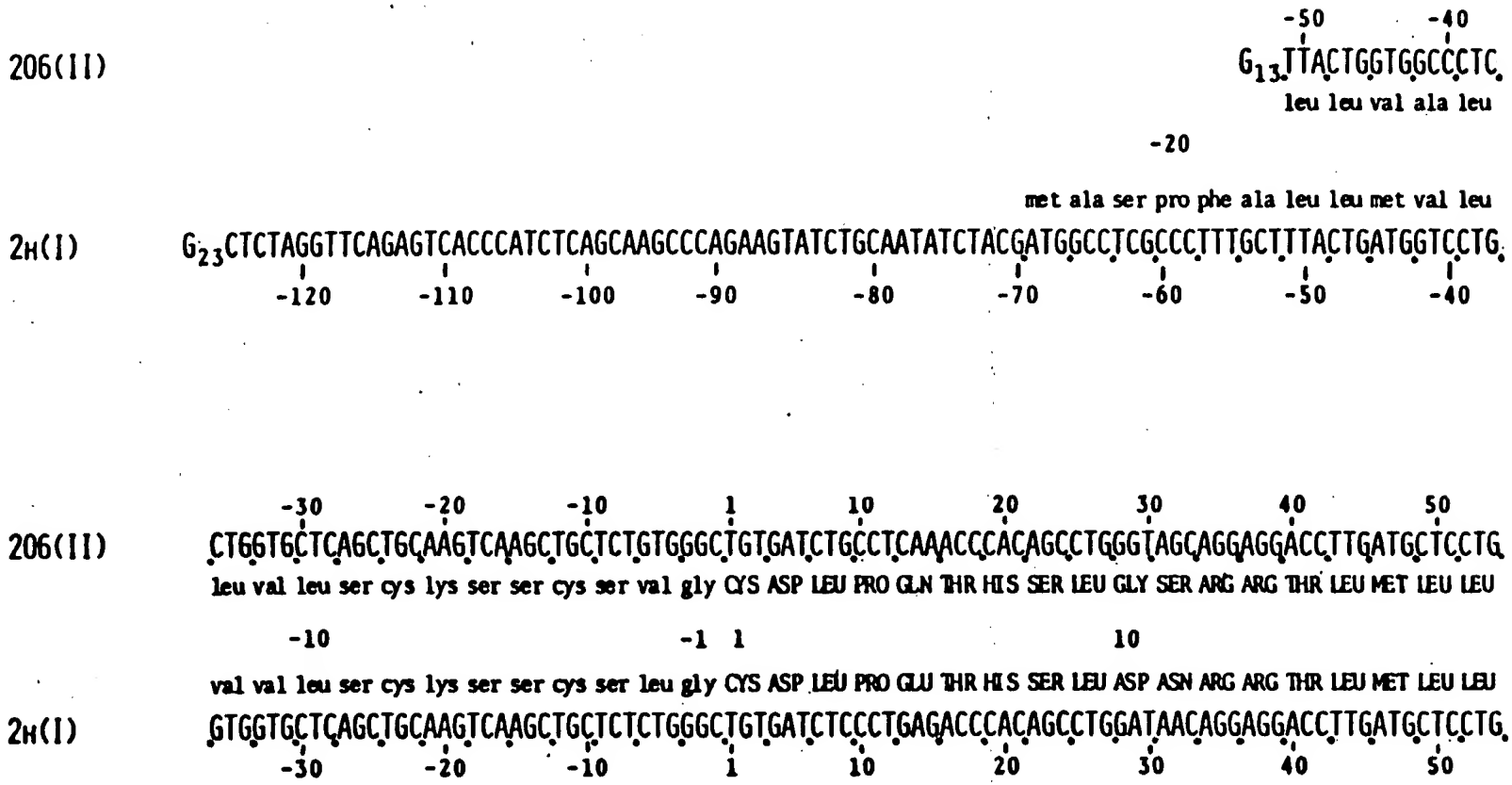


FIG. 12

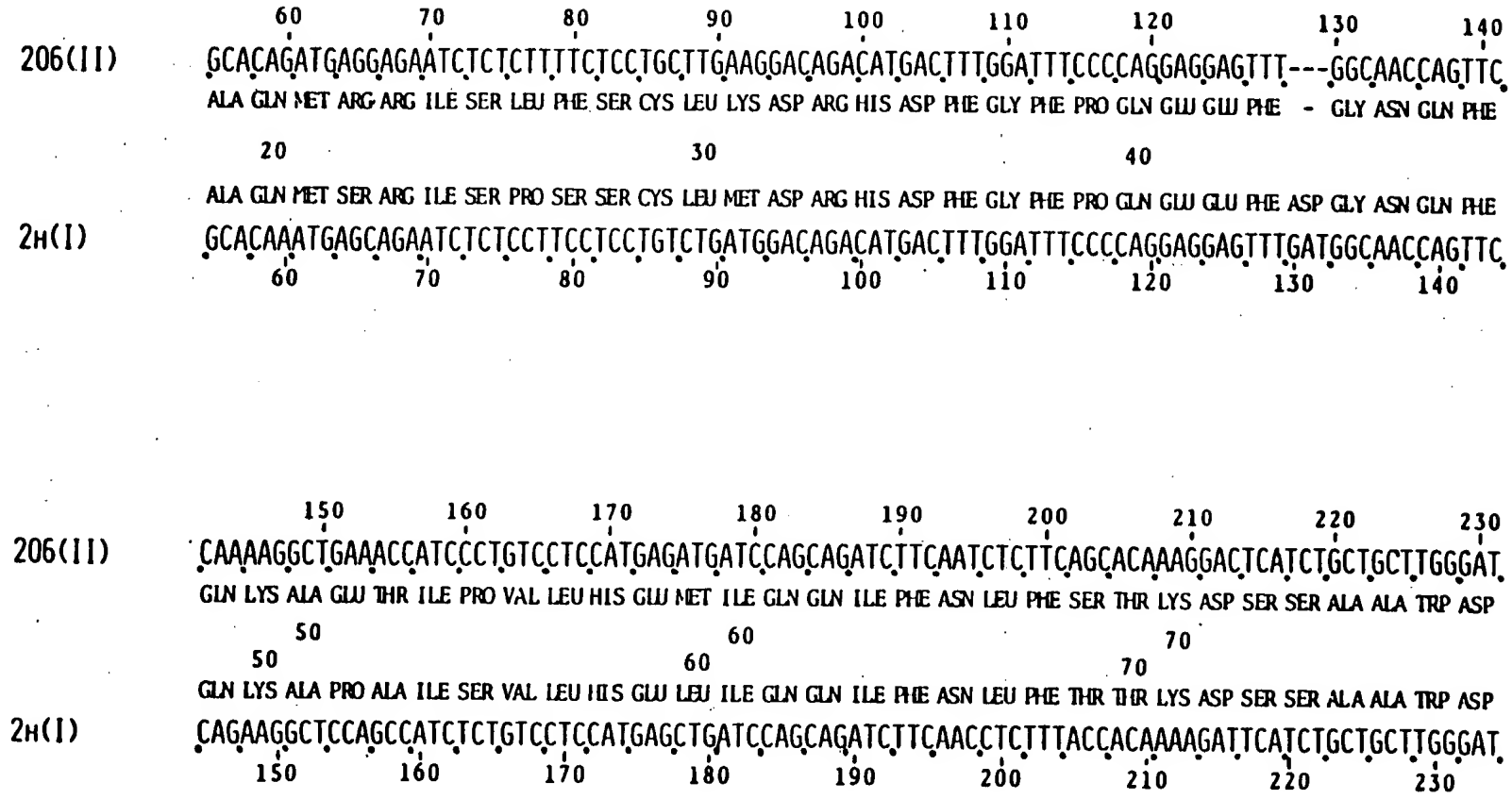

60 70 80 90 100 110 120 130 140
206(II)
GCACAGATGAGGAGAATCTCTCTTTTCTCCTGCTTGAAGGACAGACATGACTTTGGATTTCCCCAGGAGGAGTTT---GGCAACCAGTTC
ALA GLN MET ARG ARG ILE SER LEU PHE SER CYS LEU LYS ASP ARG HIS ASP PHE GLY PHE PRO GLN GLU GLU PHE - GLY ASN GLN PHE
20 30 40
ALA GLN MET SER ARG ILE SER PRO SER SER CYS LEU MET ASP ARG HIS ASP PHE GLY PHE PRO GLN GLU GLU PHE ASP GLY ASN GLN PHE
2H(I)
GCACAAATGAGCAGAATCTCTCCTTCCTCCTGTCTGATGGACAGACATGACTTTGGATTTCCCCAGGAGGAGTTTGATGGCAACCAGTTC
60 70 80 90 100 110 120 130 140
150 160 170 180 190 200 210 220 230
206(II)
CAAAAGGCTGAAACCATCCCTGTCCTCCATGAGATGATCCAGCAGATCTTCAATCTCTTCAGCACAAAGGACTCATCTGCTGCTTGGGAT
GLN LYS ALA GLU THR ILE PRO VAL LEU HIS GLU MET ILE GLN GLN ILE PHE ASN LEU PHE SER THR LYS ASP SER SER ALA ALA TRP ASP
50 60 70
50 60 70
GLN LYS ALA PRO ALA ILE SER VAL LEU HIS GLU LEU ILE GLN GLN ILE PHE ASN LEU PHE THR THR LYS ASP SER SER ALA ALA TRP ASP
2H(I)
CAGAAGGCTCCAGCCATCTCTGTCCTCCATGAGCTGATCCAGCAGATCTTCAACCTCTTTACCACAAAAGATTCATCTGCTGCTTGGGAT
150 160 170 180 190 200 210 220 230

FIG. 13

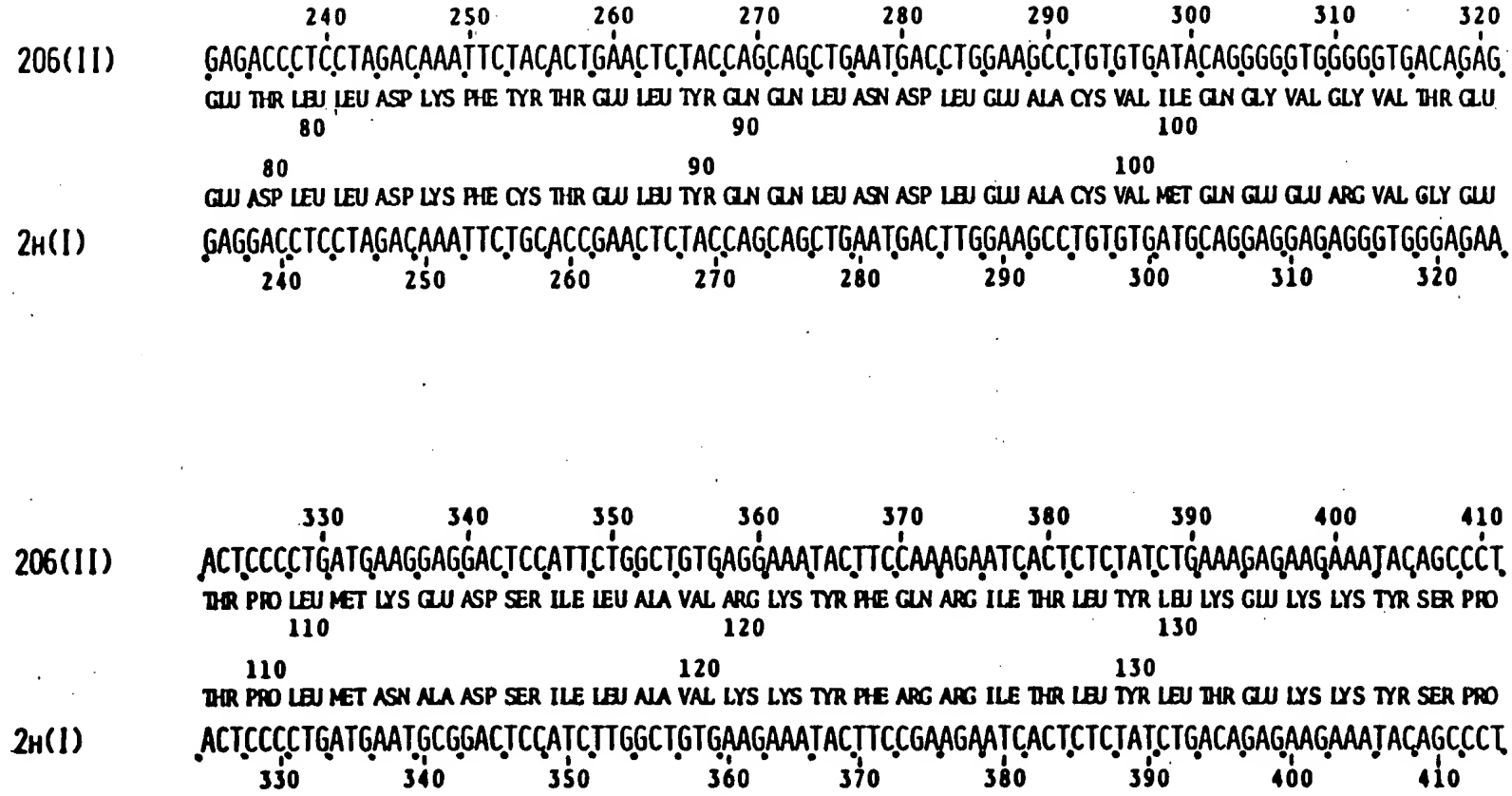


FIG. 14

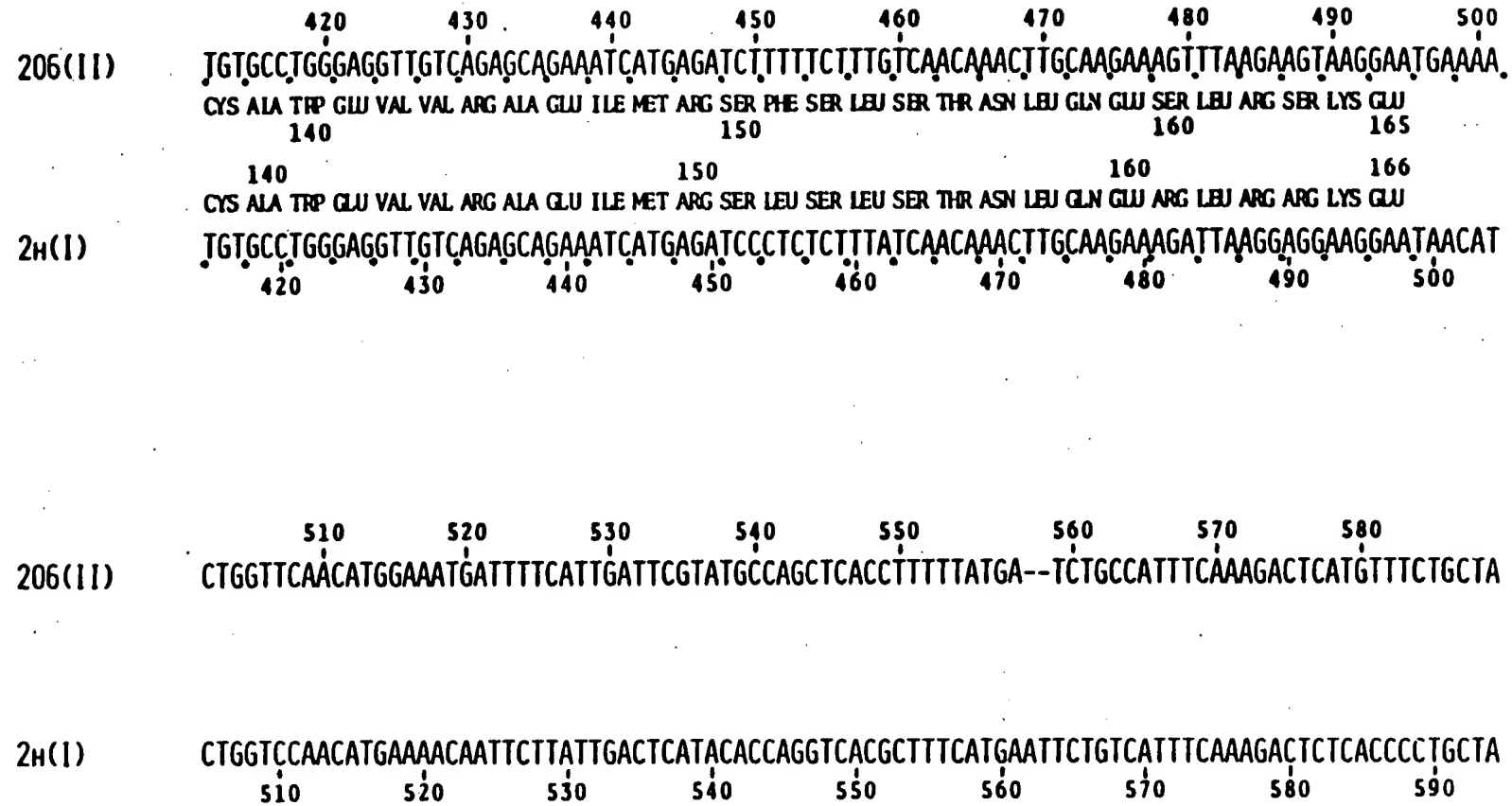


FIG. 15

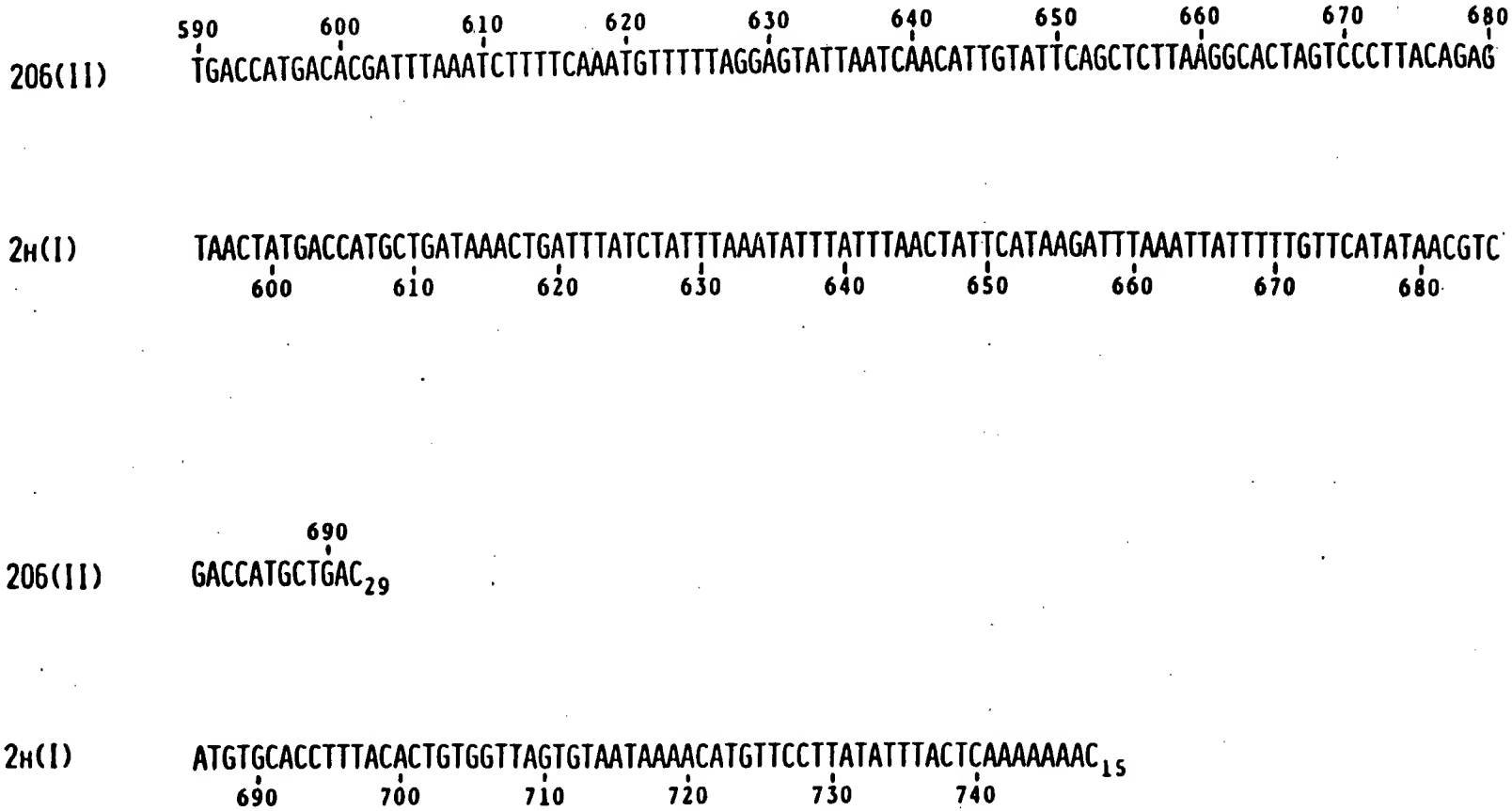

590 600 610 620 630 640 650 660 670 680
206(II) TGACCATGACACGATTTAAATCTTTTCAAATGTTTTTAGGAGTATTAATCAACATTGTATTCAGCTCTTAAGGCACTAGTCCCTTACAGAG
2H(I) TAACTATGACCATGCTGATAAACTGATTTATCTATTTAAATATTTATTTAACTATTCATAAGATTTAAATTATTTTTGTTCATATAACGTC
600 610 620 630 640 650 660 670 680
690
206(II) GACCATGCTGAC29
2H(I) ATGTGCACCTTTACACTGTGGTTAGTGTAATAAAACATGTTCCTTATATTTACTCAAAAAAAC15
690 700 710 720 730 740

FIG. 16

FIG. 17

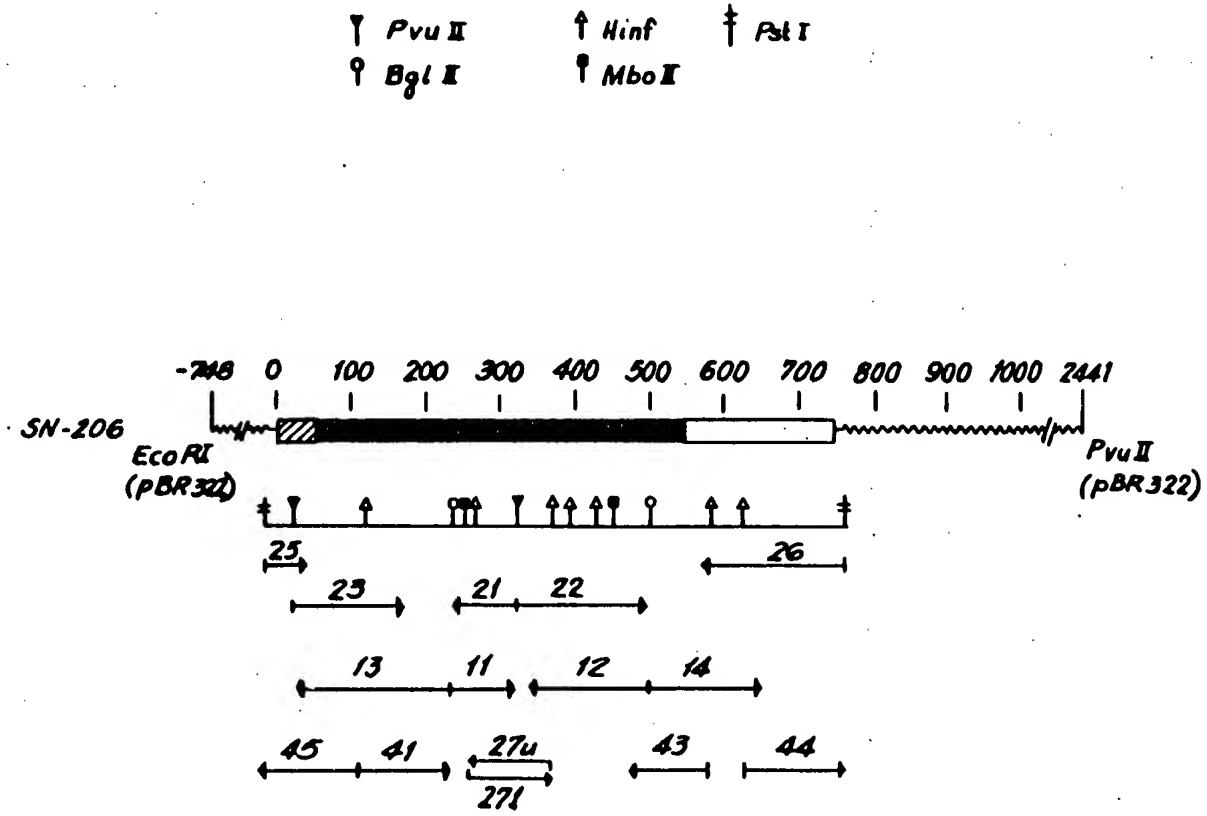
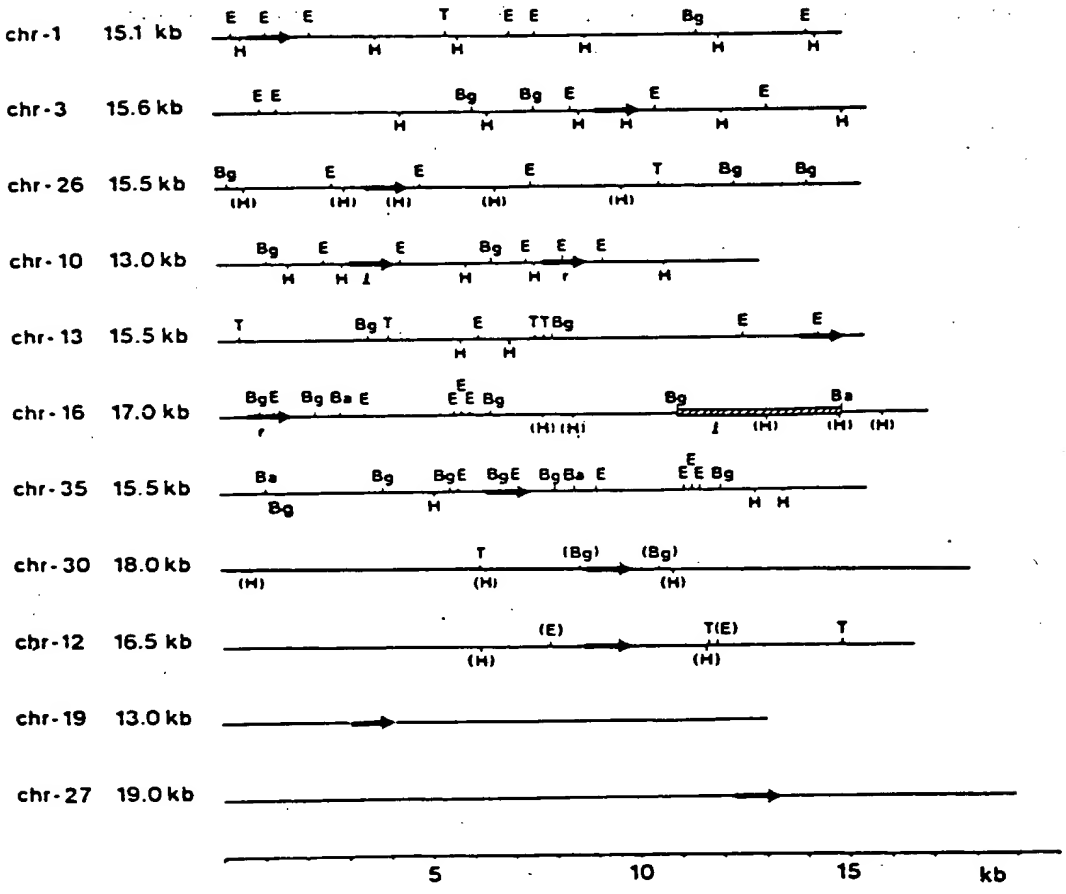

Pvu II
Hinf
Pst I
Bgl II
Mbo II
-248
0
100
200
300
400
500
600
700
800
900
1000
2441
SN-206
EcoRI
(pBR322)
PvuII
(pBR322)
25
26
23
21
22
13
11
12
14
45
41
27u
27l
43
44

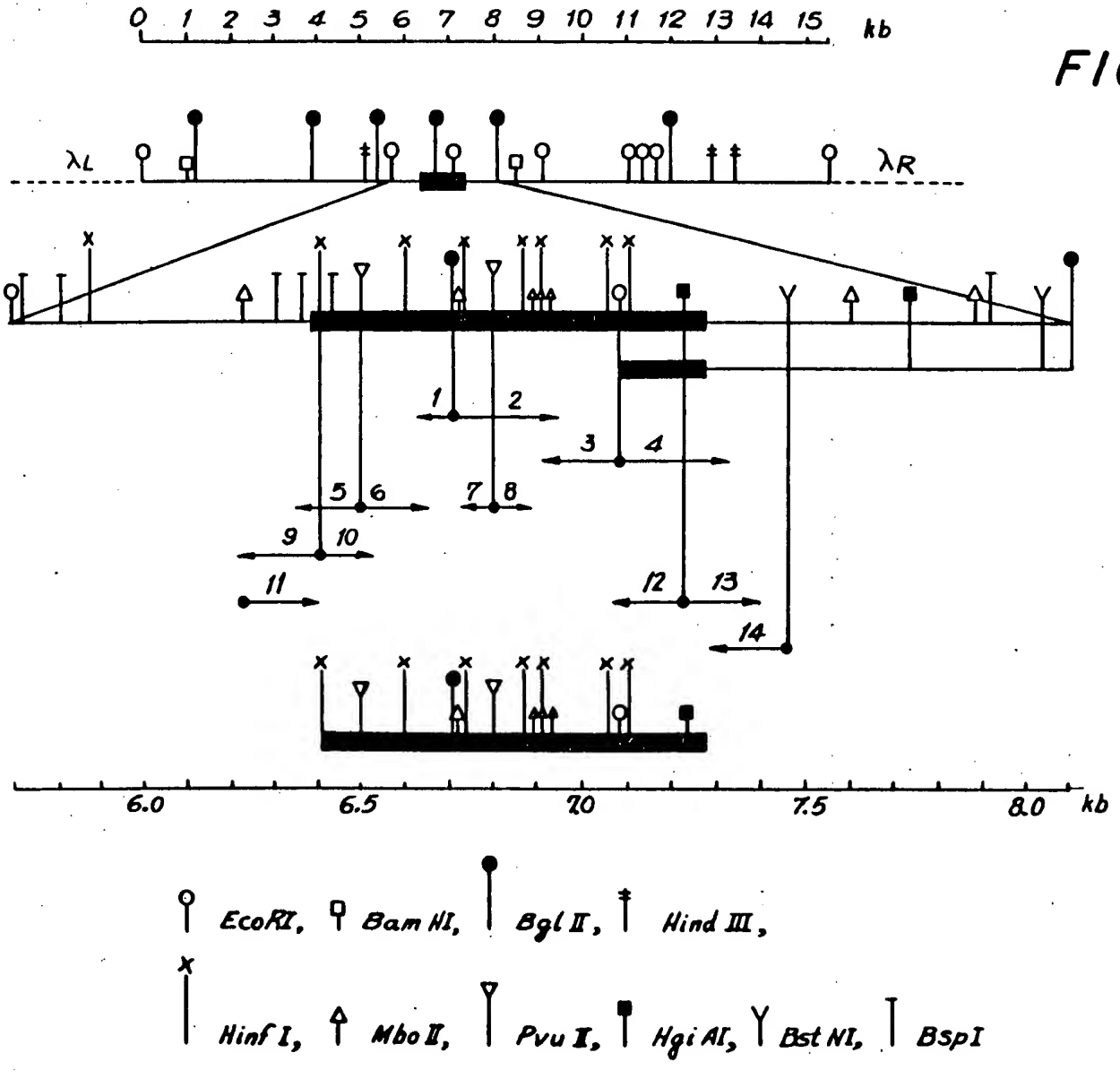
FIG. 18

PARTIAL RESTRICTION MAPS OF CLONED, IFN-α RELATED CHROMOSOMAL DNA SEGMENTS



E : EcoRI, Ba : BamHI, Bg : BglII, H : HincII, T : TaqI

FIG. 19


0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 kb
λL
λR
1 2
3 4
5 6
7 8
9 10
11
12 13
14
6.0 6.5 7.0 7.5 8.0 kb
EcoRI, Bam HI, Bgl II, Hind III,
Hinf I, Mbo II, Pvu I, Hgi AI, Bst NI, BspI

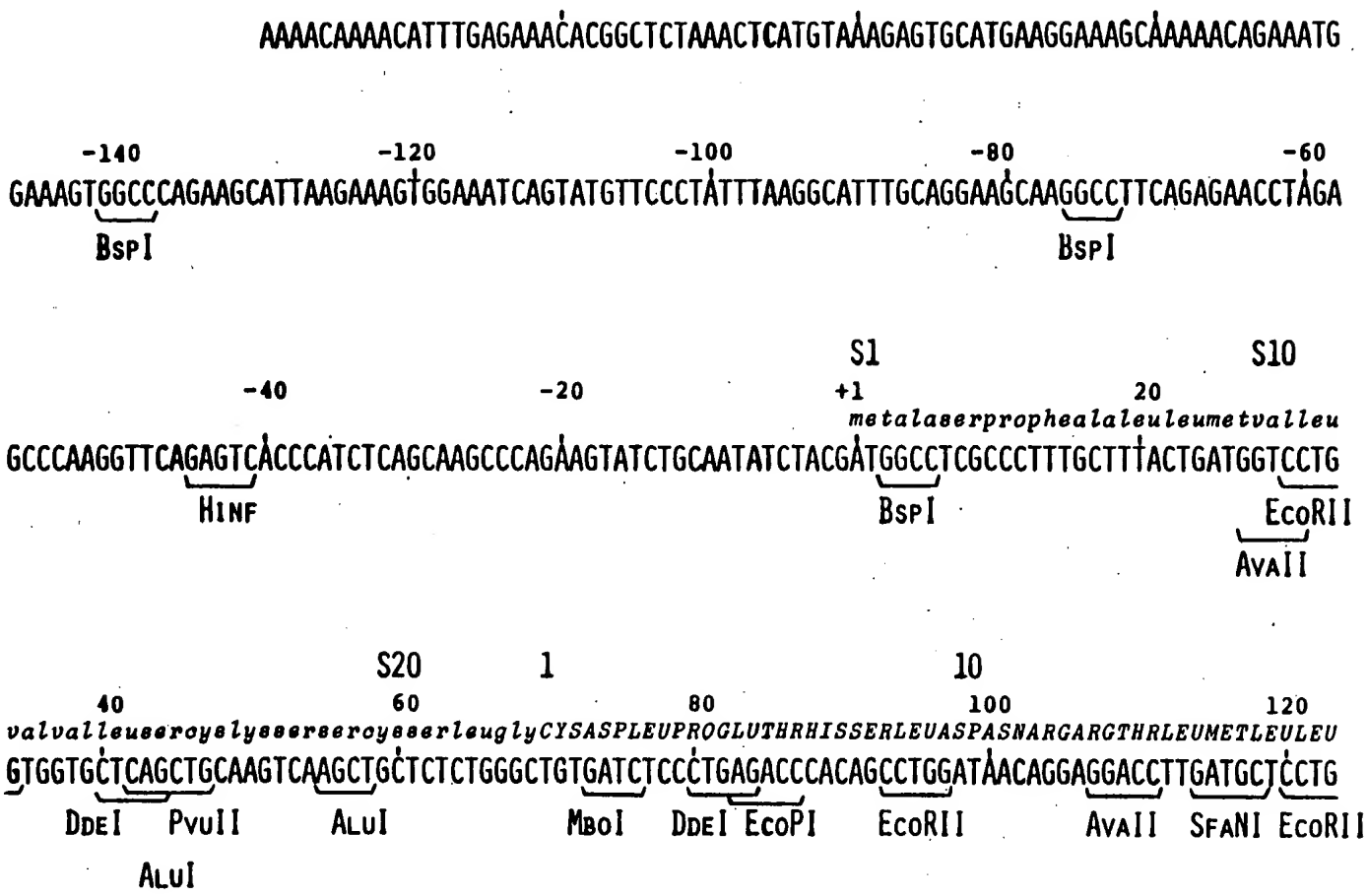

AAAACAAAACATTTGAGAAACACGGCTCTAAACTCATGTAAAGAGTGCATGAAGGAAAGCAAAAACAGAAATG
-140
-120
-100
-80
-60
GAAAGTGGCCCAGAAGCATTAAGAAAGTGGAAATCAGTATGTTCCCTATTTAAGGCATTTGCAGGAAGCAAGGCCTTCAGAGAACCTAGA
BspI
BspI
S1
S10
-40
-20
+1
20
metalaserprophealaleuleumetvalleu
GCCCAAGGTTCAGAGTCACCCATCTCAGCAAGCCCAGAAGTATCTGCAATATCTACGATGGCCTCGCCCTTTGCTTTACTGATGGTCCTG
HINF
BspI
EcoRII
AvaII
S20
1
10
40
60
80
100
120
valvalleuseroyslysserseroysserleuglyCYSASPLEUPROGLUTHRHISSERLEUASPASNARGARGTHRLEUMETLEULEU
GTGGTGCTCAGCTGCAAGTCAAGCTGCTCTCTGGGCTGTGATCTCCCTGAGACCCACAGCCTGGATAACAGGAGGACCTTGATGCTCCTG
DdeI
PvuII
AluI
AluI
MboI
DdeI
EcoPI
EcoRII
AvaII
SfaNI
EcoRII

FIG. 20

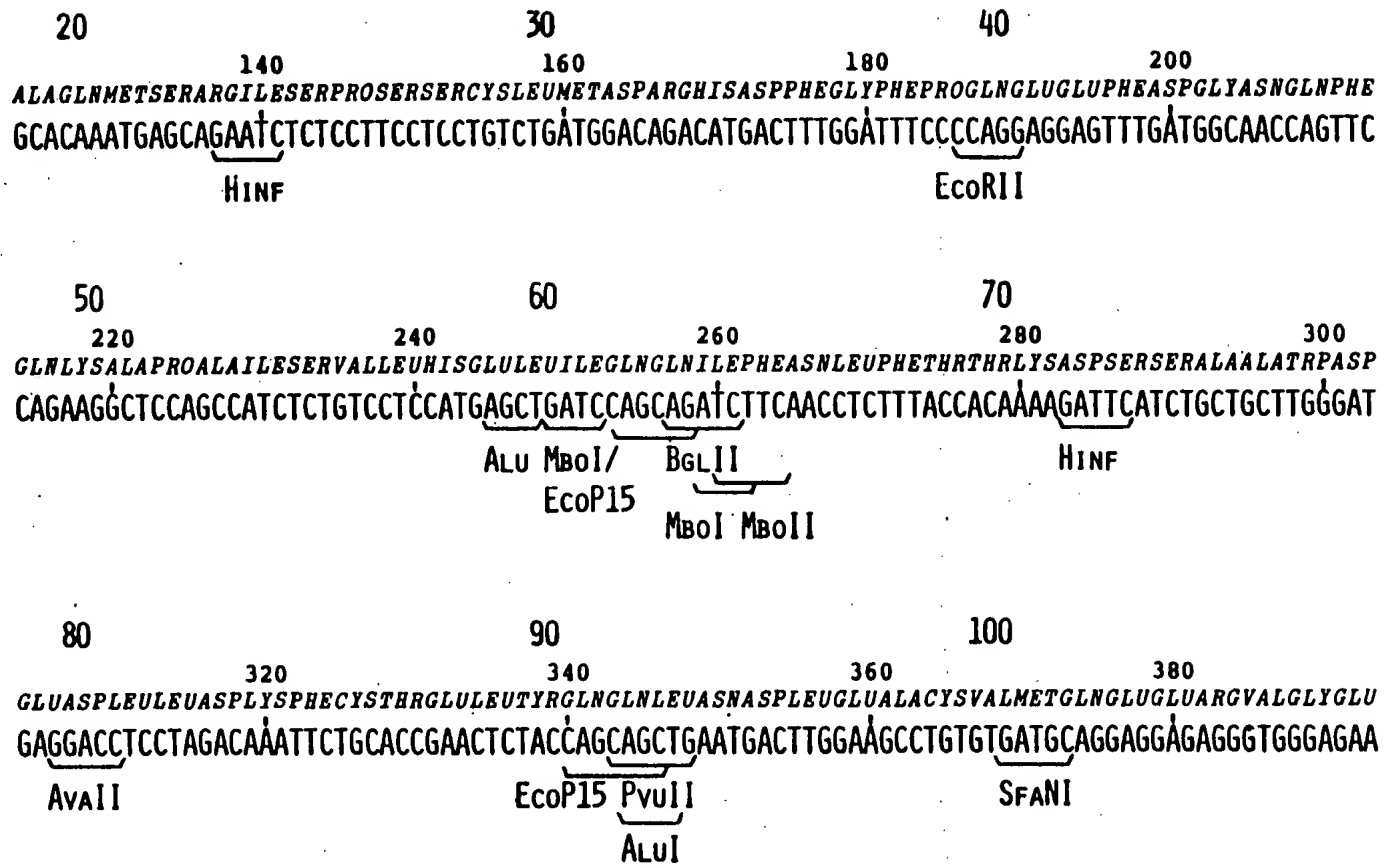


FIG. 21

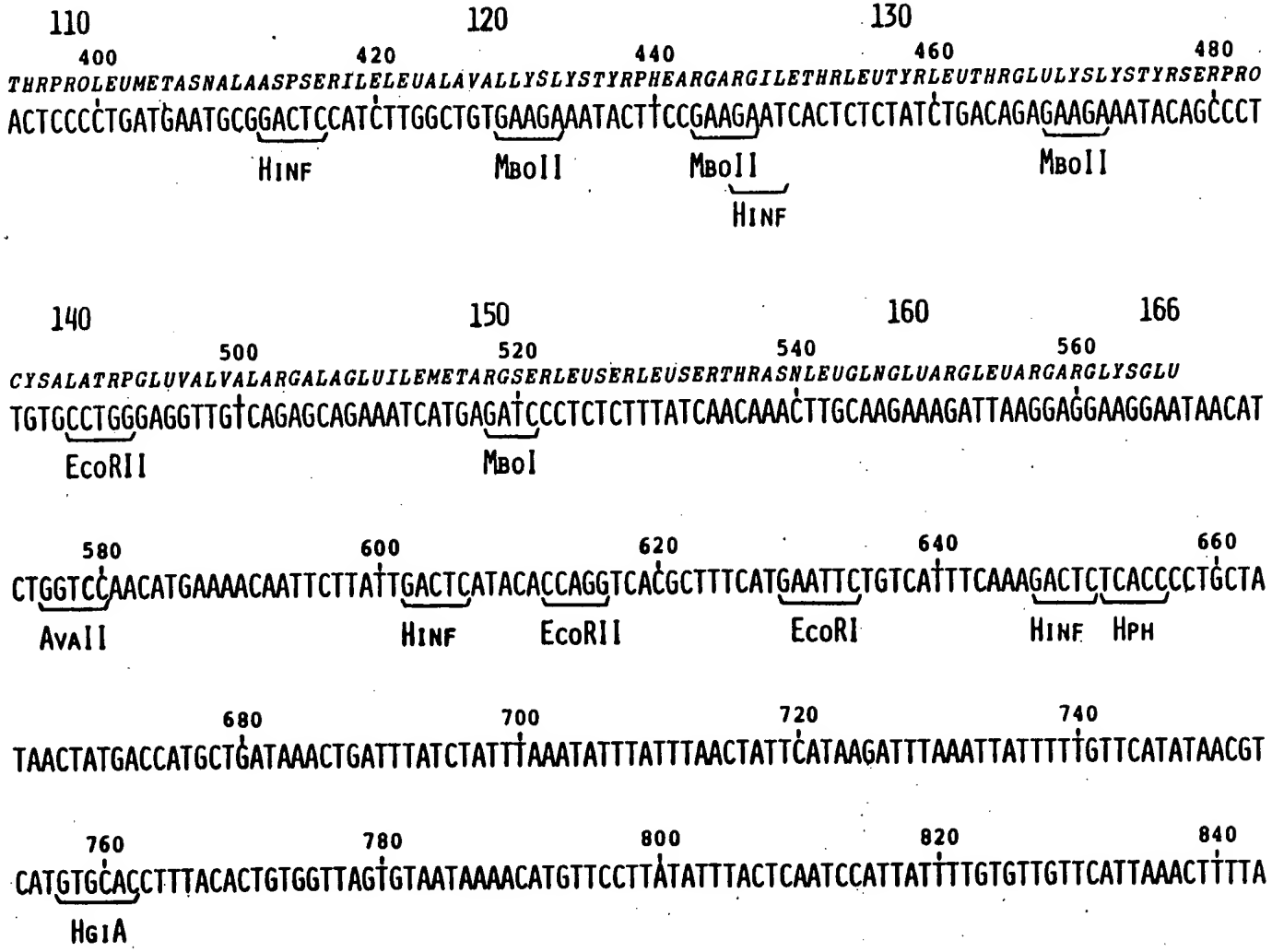


FIG. 22

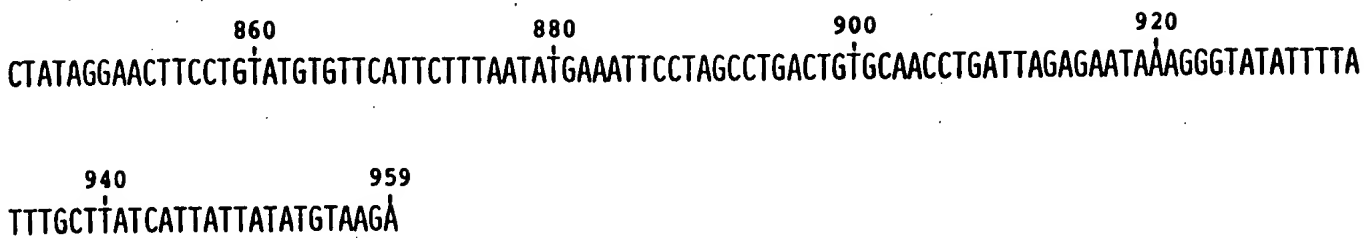

860
880
900
920
CTATAGGAACTTCCTGTATGTGTTCATTCTTTAATATGAAATTCCTAGCCTGACTGTGCAACCTGATTAGAGAATAAAGGGTATATTTTA
940
959
TTTGCTTATCATTATTATATGTAAGA

FIG. 23

FIG. 24

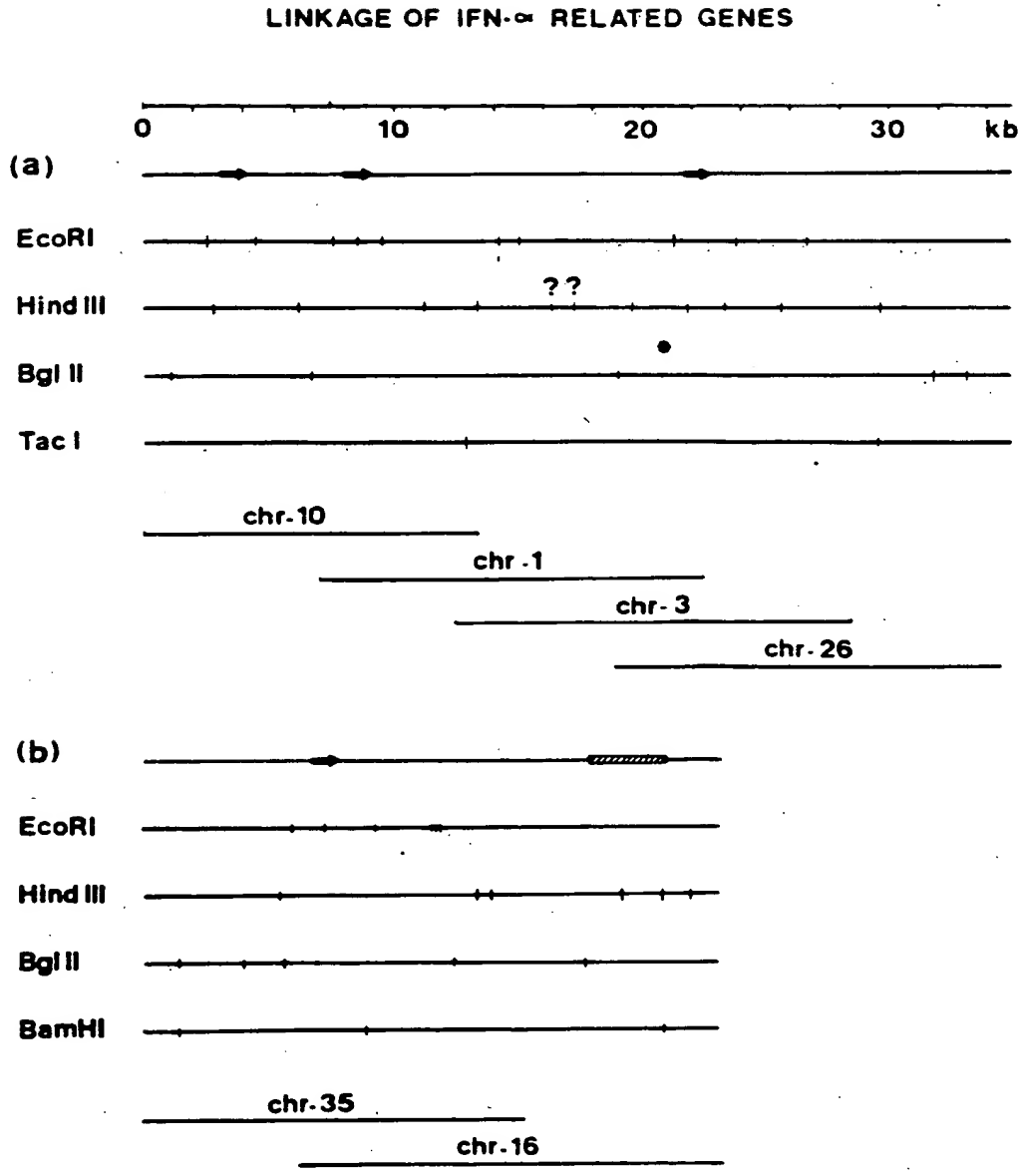

LINKAGE OF IFN-α RELATED GENES
0
10
20
30
kb
(a)
EcoRI
Hind III
??
Bgl II
Tac I
chr-10
chr-1
chr-3
chr-26
(b)
EcoRI
Hind III
Bgl II
BamHI
chr-35
chr-16

FIG. 25

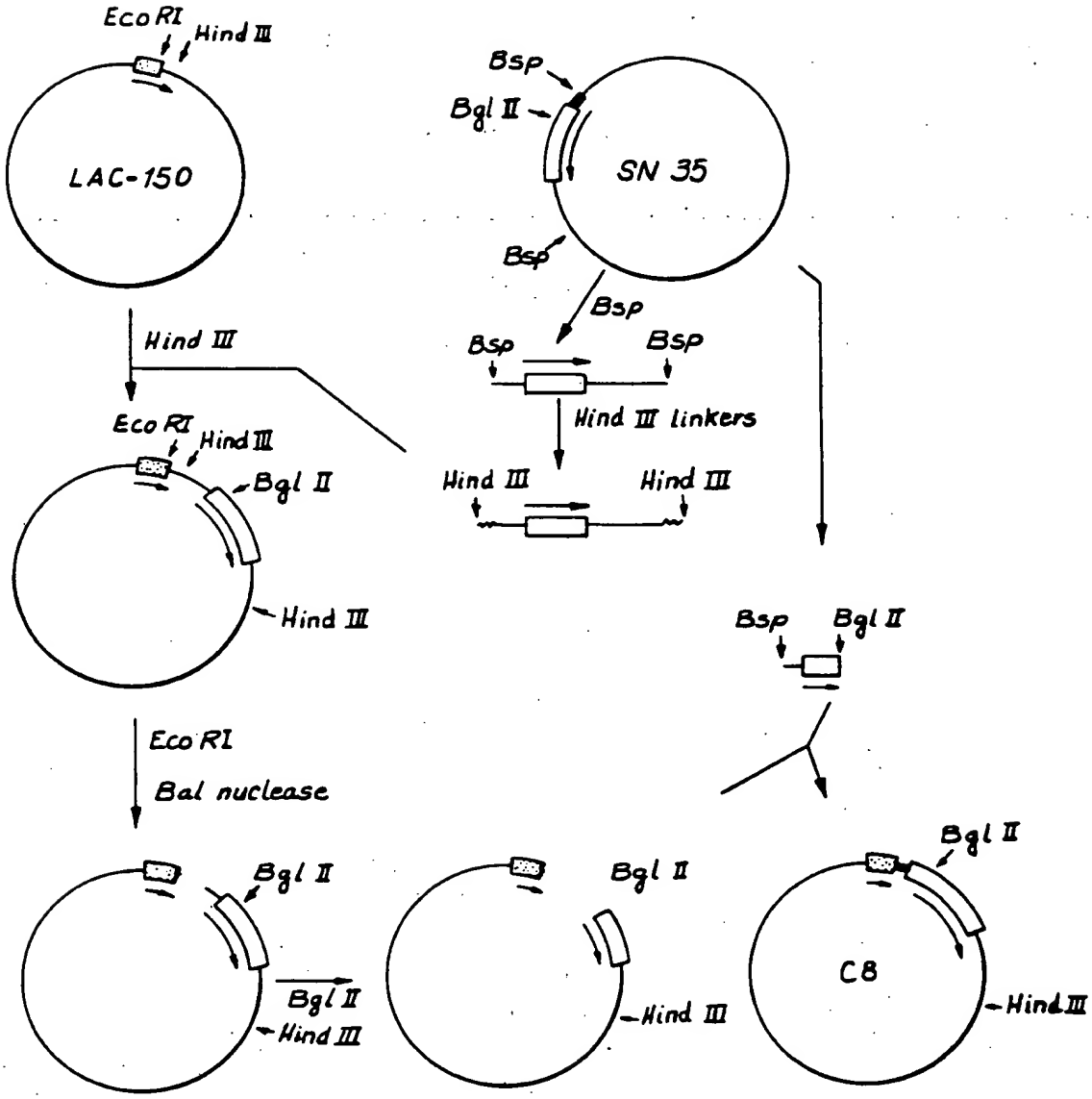

Eco RI
Hind III
LAC-150
Hind III
Eco RI
Hind III
Bgl II
Hind III
Eco RI
Bal nuclease
Bgl II
Bgl II
Hind III
Bsp
Bgl II
SN 35
Bsp
Bsp
Bsp
Bsp
Hind III linkers
Hind III
Hind III
Bsp
Bgl II
Bgl II
Hind III
Bgl II
C8
Hind III

FIG. 26

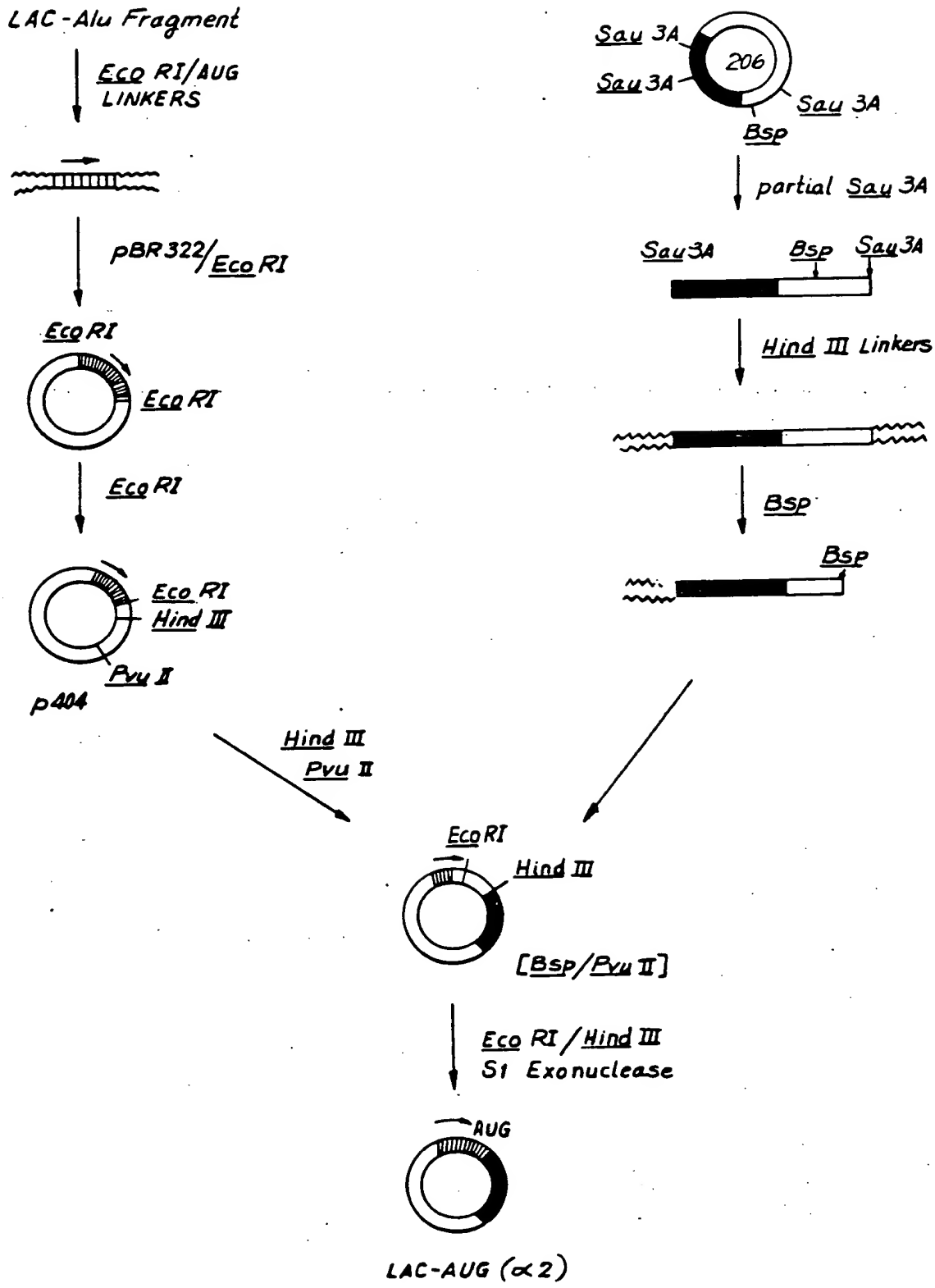

LAC-Alu Fragment
Eco RI/AUG LINKERS
pBR322/Eco RI
Eco RI
Eco RI
Eco RI
Eco RI
Hind III
Pvu II
p404
Sau 3A
206
Sau 3A
Sau 3A
Bsp
partial Sau 3A
Sau3A
Bsp
Sau3A
Hind III Linkers
Bsp
Bsp
Hind III
Pvu II
Eco RI
Hind III
[Bsp/Pvu II]
Eco RI / Hind III
S1 Exonuclease
AUG
LAC-AUG (α2)

FIG. 27

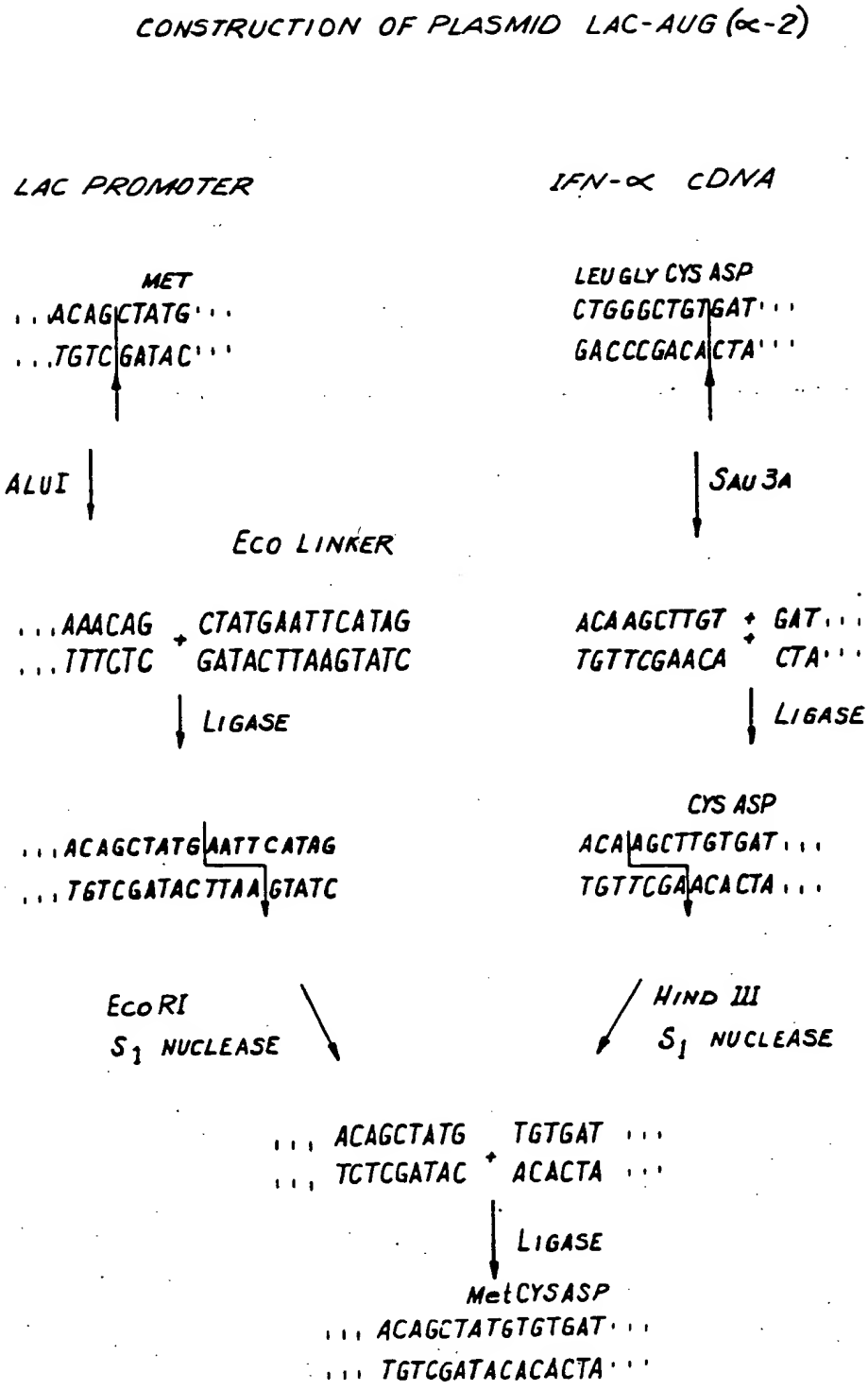
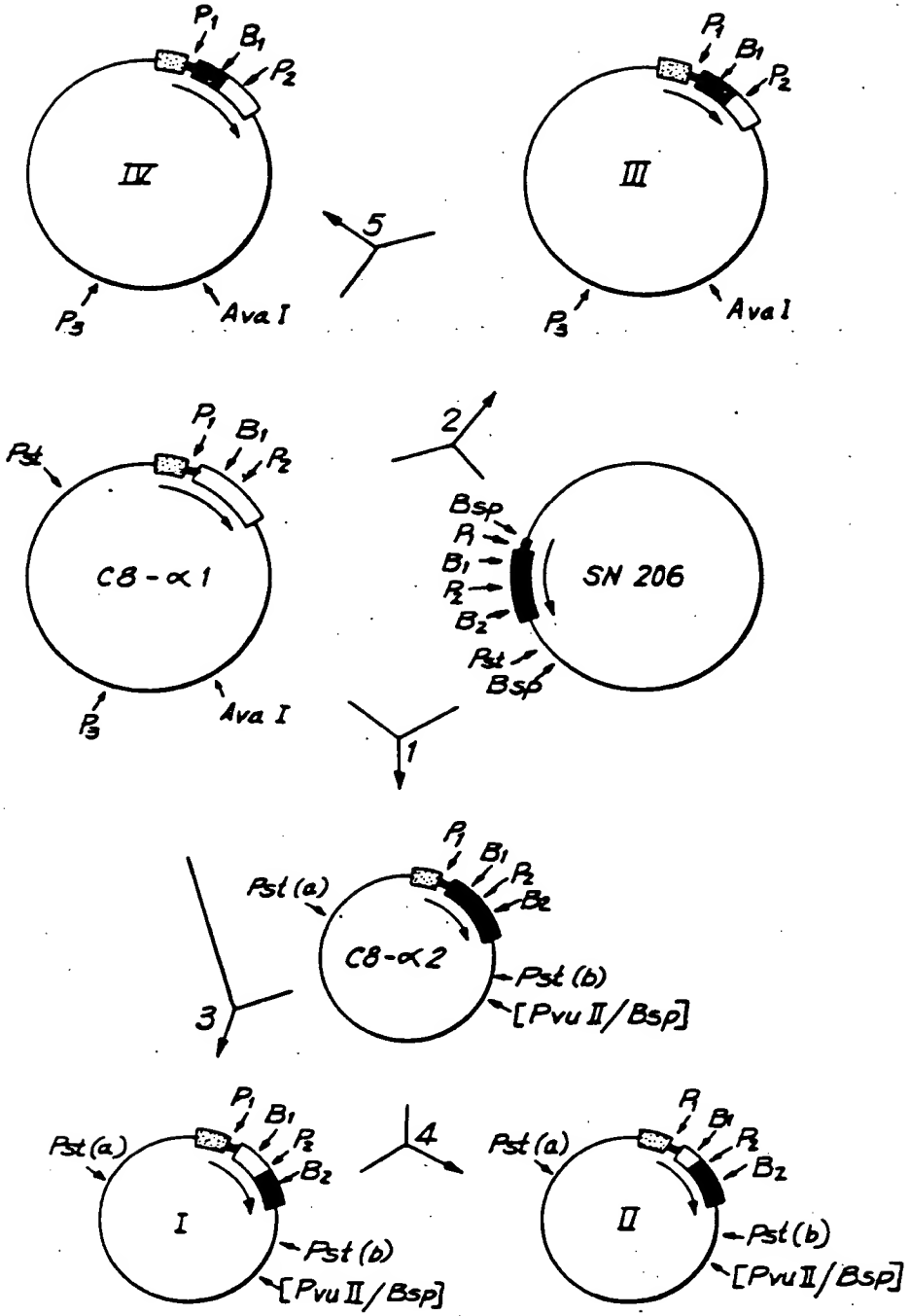

CONSTRUCTION OF PLASMID LAC-AUG (α-2)
LAC PROMOTER
IFN-α cDNA
MET
...ACAGCTATG...
...TGTCGATAC...
LEU GLY CYS ASP
CTGGGCTGTGAT...
GACCCGACACTA...
ALUI
SAU 3A
ECO LINKER
...AAACAG + CTATGAATTCATAG
...TTTCTC + GATACTTAAGTATC
ACAAGCTTGT + GAT...
TGTTCGAACA + CTA...
LIGASE
LIGASE
CYS ASP
...ACAGCTATGAATTCATAG
...TGTCGATACTTAAGTATC
ACAAGCTTGTGAT...
TGTTCGAACACTA...
ECO RI
S1 NUCLEASE
HIND III
S1 NUCLEASE
...ACAGCTATG + TGTGAT...
...TCTCGATAC + ACACTA...
LIGASE
MetCYSASP
...ACAGCTATGTGTGAT...
...TGTCGATACACACTA...

FIG. 28


P1
B1
P2
IV
P3
Ava I
5
III
2
Bsp
R1
B1
R2
B2
Pst
SN 206
C8-α1
1
C8-α2
Pst (a)
Pst (b)
[Pvu II/Bsp]
3
4
I
II

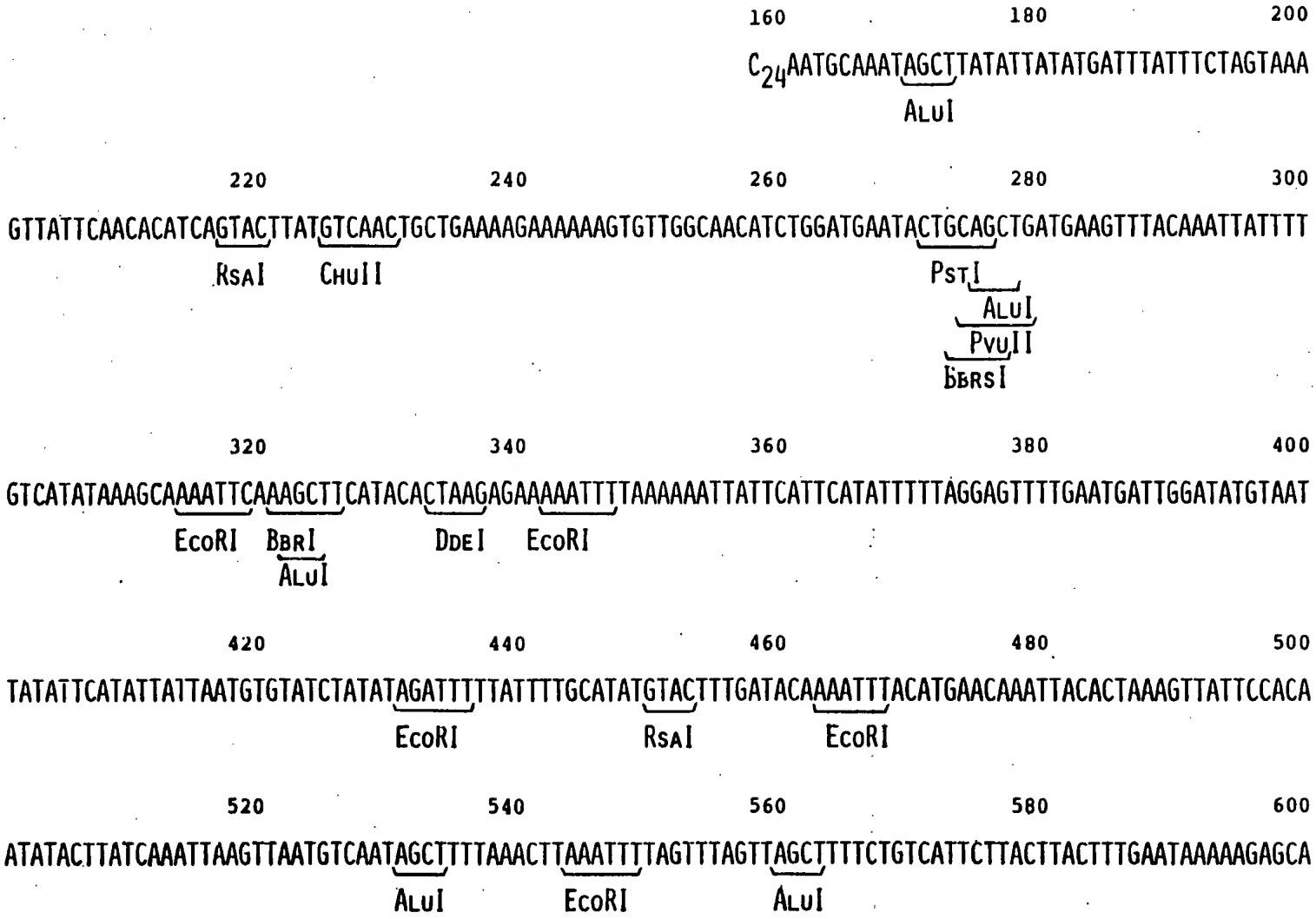


FIG. 29

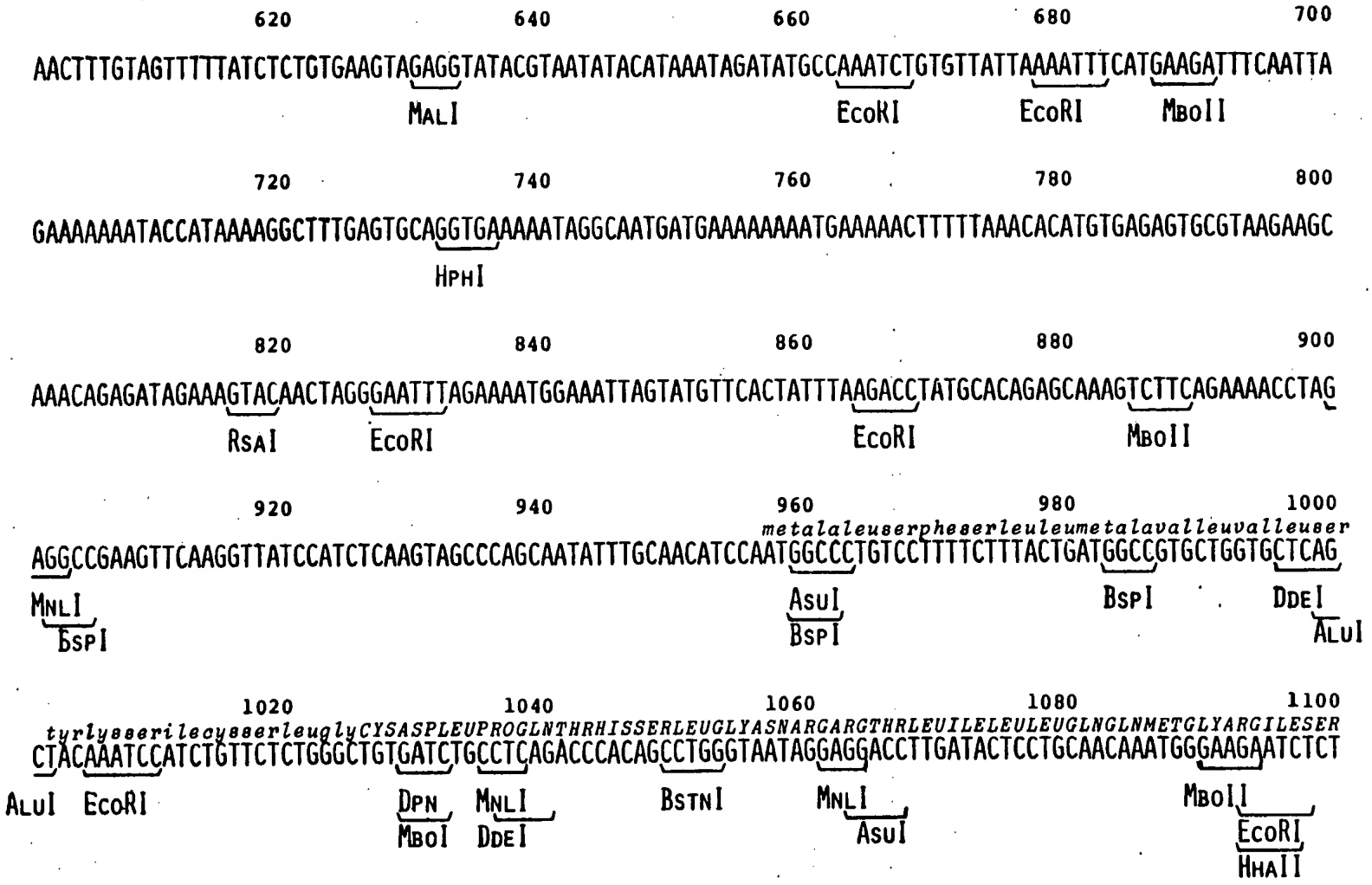

620 640 660 680 700
AACTTTGTAGTTTTTATCTCTGTGAAGTAGAGGTATACGTAATATACATAAATAGATATGCCAAATCTGTGTTATTAAAATTTCATGAAGATTTCAATTA
MALI EcoRI EcoRI MBOII
720 740 760 780 800
GAAAAAAATACCATAAAAGGCTTTGAGTGCAGGTGAAAAATAGGCAATGATGAAAAAAAATGAAAAACTTTTTAAACACATGTGAGAGTGCGTAAGAAGC
HPHI
820 840 860 880 900
AAACAGAGATAGAAAGTACAACTAGGGAATTTAGAAAATGGAAATTAGTATGTTCACTATTTAAGACCTATGCACAGAGCAAAGTCTTCAGAAAACCTAG
RSAI EcoRI EcoRI MBOII
920 940 960 980 1000
metalaleuserpheserleuleumetalavalleuvalleuser
AGGCCGAAGTTCAAGGTTATCCATCTCAAGTAGCCCAGCAATATTTGCAACATCCAATGGCCCTGTCCTTTTCTTTACTGATGGCCGTGCTGGTGCTCAG
MNLI BSPI ASUI BSPI BSPI DDEI ALUI
1020 1040 1060 1080 1100
tyrlysserilecysserleuglyCYSASPLEUPROGLNTHRHISSERLEUGLYASNARGARGTHRLEUILELEULEUGLNGLNMETGLYARGILESER
CTACAAATCCATCTGTTCTCTGGGCTGTGATCTGCCTCAGACCCACAGCCTGGGTAATAGGAGGACCTTGATACTCCTGCAACAAATGGGAAGAATCTCT
ALUI EcoRI DPN MBOI MNLI DDEI BSTNI MNLI ASUI MBOII EcoRI HHAII

FIG. 30

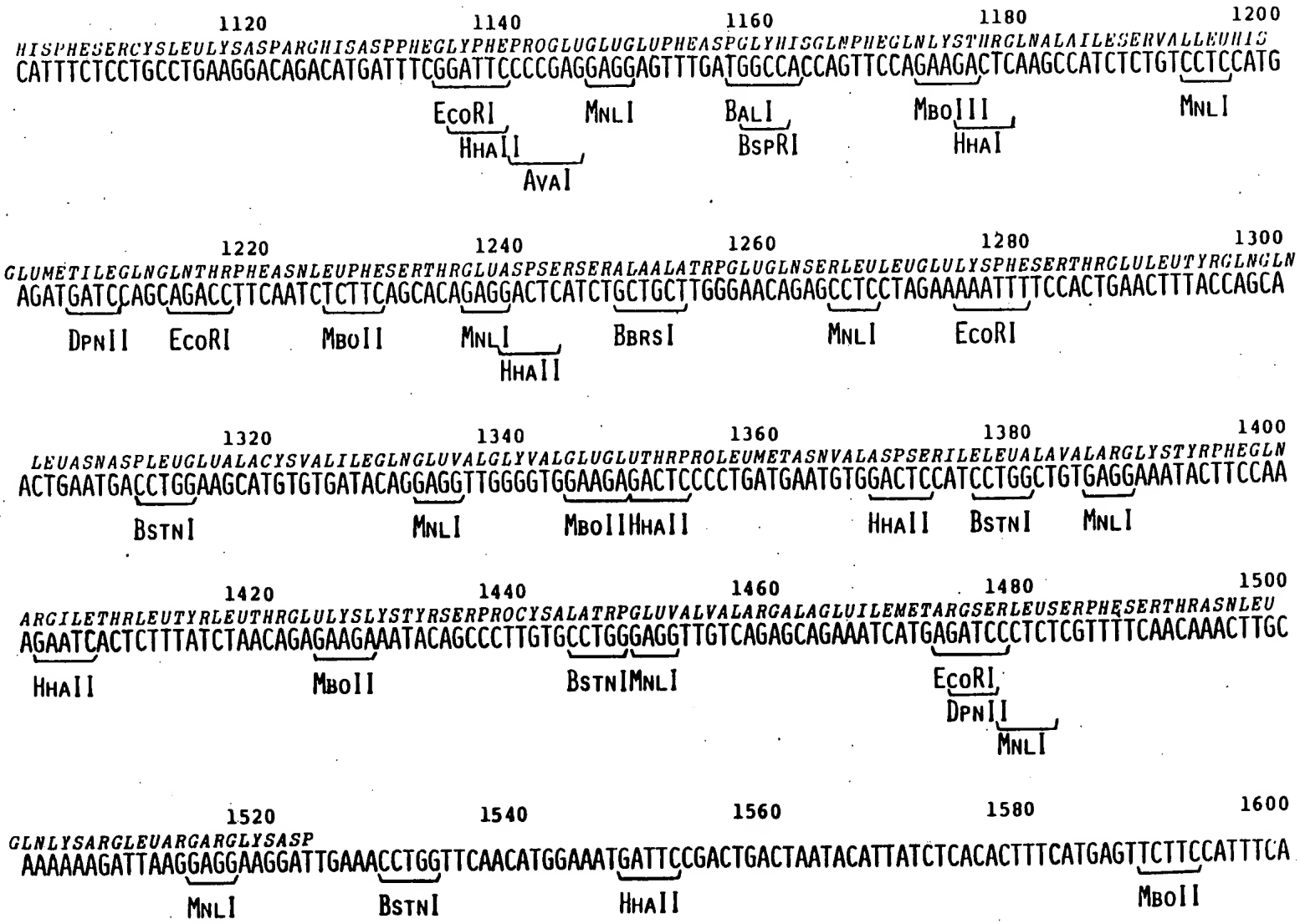


FIG. 31

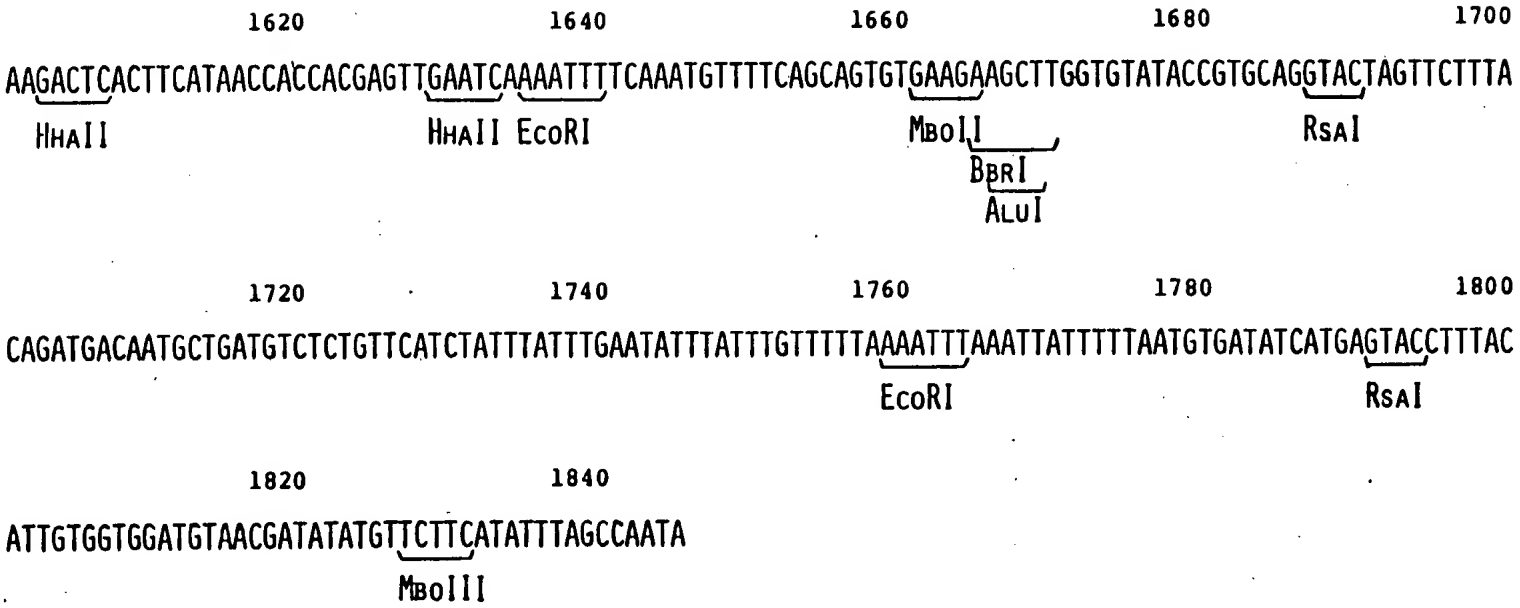


FIG 32